Tonsillitis.

Diphtheria.

The appearance of the throat in tonsillitis and diphtheria.
[Dr. Louis S. Somers, from Vol. I, Series 16, International Clinics.]

A NURSE'S HAND-BOOK

OF

MEDICINE

BY

J. NORMAN HENRY, M.D.

CLINICAL PROFESSOR OF MEDICINE, WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA; ASSISTANT PHYSICIAN, PHILADELPHIA HOSPITAL; PHYSICIAN TO OUT-PATIENT DEPARTMENT AND LECTURER TO NURSES, PENNSYLVANIA HOSPITAL, ETC.

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PREFACE

THIS book comprises the substance of lectures delivered by me to the nurses of the Pennsylvania Hospital during the last six years, and is designed to supply what I am told is a much-felt want,—namely, a handbook devoted specially to nursing in medical cases, and general medical information for nurses and others interested in nursing.

In the description of the various diseases only the most common ones and those which are of particular interest to the nurse have been considered.

I have in this connection borrowed freely from the standard text-books of medicine, and am much indebted to them for the definitions and descriptions of the courses of many of the diseases embodied in my work.

I am indebted also to Miss Lucy Walker, Matron and Superintendent of Nurses at the Pennsylvania Hospital, for rearrangement of much of the manuscript as well as for many suggestions, and to Miss Martha Byerly, Assistant Matron, for the recipes contained in the chapter on diet.

J. N. H.

[redacted]

INTRODUCTION

THE profession of nursing is one which demands much and often gives but little in return. The ideal nurse should be physically strong, tactful, patient, capable of much self-effacement, and free from false pride, in addition, of course, to possessing a thorough knowledge of her profession.

To a woman accustomed to refined surroundings there are many duties in the actual practice of nursing that are distasteful, but which none the less must be performed with the best grace possible. The disagreeable as well as the brighter side should be thoroughly and deliberately studied before the would-be nurse decides on adopting a vocation which requires such long and arduous training. By so doing the mind would be disabused of that sentimental picture of the trained nurse which has drawn so many young women to enter a training-school, and withdraw in a ridiculously short time on finding the supposed path of roses full of thorns.

Somewhat different qualifications are necessary in nurses according to the particular kind of work that they are doing. The thorough educational course which to-day is common to all our first-class training-schools is given with the twofold idea of teaching a nurse in her hospital training in such a way that she may take an intelligent part in the work, and, secondly, that, if either in private practice or in some distant military or mission hospital the nurse far from possible medical aid be faced with a crisis, she may assume the responsibility of action with confidence and a good hope of success.

In our city hospitals, and in private work in cities, such action on the part of a nurse is rarely, if ever, nec-

essary, while in the aforementioned conditions in out-of-the-way places such qualities of confidence and ability to act unaided in an emergency are great and necessary virtues.

Much has been said and written of the qualifications necessary in a nurse, but when all is said and done widely different qualities in different women sometimes accompany equal degrees of success. Granted a real love of her profession much of the most difficult parts become smooth. Naturally a nurse enters a private house with the idea of making as little additional trouble in the general housekeeping as possible. She should, therefore, behave tactfully towards the servants, as well as to an anxious and nervous family. She should appeal to the attending physician in all matters which defy her own efforts to manage by tact. She should talk little of herself, her former cases, or of the physicians for whom she has worked, and should never complain to her patient or the family of overwork or fatigue. If she finds that some additional help in the nursing is required she should first address the attending physician about the matter, and let him be the one to arrange the details with the family. In many cases in diseases of short duration, even though severe, it is often necessary for a nurse to assume sole charge of the case to tide over a crisis of some sort. There are nurses unusually endowed with physical strength, patience, and devotion to their work who are able to take charge of typhoid fever cases in private practice single-handed, and throughout the attack administer the treatment at third-hour intervals night and day. It is not every one, however, who is able to perform such feats, and of the average nurse no such trial is, as a rule, either desirable or necessary.

A nurse should never give up a case or resign a position because of some petty offence on the part of the patient or family, but should take such a situation phil-

osophically and put forth her best efforts to make a particular success of a case when the difficulties are greatest. It must be understood, however, that sometimes two natures will not agree, and it may become necessary for a nurse to withdraw or be withdrawn owing to this incompatibility of character.

Nurses in private work should also bear in mind the importance of keeping pace with nursing progress, and the possibility of dropping behind the times unless a certain amount of brushing-up be done. They should keep in touch with the alumnæ societies of their hospitals and take journals devoted to nursing.

Amusements of one sort or another are very necessary in the lives of all, and particularly in those devoted to such a serious and exacting profession. Intelligent people recognize this fact, and often insist upon the nurse taking some amusement or recreation during the progress of an illness, to the manifest advantage of both patient and nurse. In nursing among the poor, ingenuity is often taxed to the utmost to improvise things to take the place of what in wealthier walks are considered the necessities of life. Here, indeed, those qualities of tact, kindliness, the wish to make the best out of the bad, and the true love of the work are given their opportunity to shine in a way that would have filled Mark Tapley's heart with joy.

In conclusion a word of advice in regard to the short-course theoretic schools for nurses which are springing up in most of our big cities, will not be out of place. Such courses are in reality but so much time wasted in finding out how necessary a practical course of three years' training actually is. In no line of work is practical experience so necessary and theoretical work alone so useless, if not actually harmful, as in the profession of nursing.

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A NURSE'S HAND-BOOK OF MEDICINE

CHAPTER I

GENERAL CONSIDERATIONS

Definitions—Course and Terminations of Disease—Attitude Towards Usually Incurable Diseases—Proofs of Death—Observation of Nurse in Regard to Subjective and Objective Signs and Symptoms.

DISEASE is the general term applied to loss of health, whether we speak of the whole organism or of any individual organ.

Disease may be either functional or organic,—associated either with change of function or with change of structure.

Disease may be of two origins: (1) intrinsic (due to causes which arise within the human organism); (2) extrinsic (due to causes from without). It may be either: (1) inherited; (2) acquired. The tendency or predisposition to a disease is inherited more commonly than the disease itself.

An inherited disease is one which is due to inheritance from any ancestor of the patient; this inheritance may be from one or the other parent or from a more remote ancestor.

DISEASE may be—

1. *Constitutional.*—A constitutional disease is one that is general in its NATURE,—that is, which arises from causes which act upon the whole constitution of the

patient, although it may manifest its symptoms in some single organ or group. Sometimes constitutional diseases are spoken of as diathetic, and a person is said to suffer from gouty or rheumatic diathesis as the case might be. The term is derived from the Greek word *diathesis*, meaning habit.

2. *Infectious.*—An infectious disease is one capable of being conveyed from one individual to another by means of infected materials, excreta, or by insects. The term *fomites* is used in this connection to mean infected clothing, sheets, linen, wool, etc.

3. *Contagious.*—A contagious disease is one capable of transmission by contact. The term is a poor one, however, and is also used to describe certain diseases whose infection may be carried by the atmosphere.

4. *Epidemic.*—An epidemic disease is one that attacks large numbers in a given area.

5. *Endemic.*—An endemic disease is one which constantly exists in a certain area.

6. *Sporadic.*—A sporadic disease is the term applied to single isolated cases of a disease which is usually epidemic.

7. *Climatic.*—A disease may be climatic, as are dengue and yellow fever, which occur only in hot weather and disappear with the frost.

8. *Protean.*—A protean disease is one which assumes many forms or shapes.

9. *Febrile.*—A febrile disease is one accompanied by fever.

10. *Asthenic.*—An asthenic disease is one in which there is much lowering of the vitality.

11. *Sthenic.*—A sthenic disease is one in which the vitality is not depressed. It is usually accompanied by inflammation—as in pneumonia.

12. *Acute.*—An acute disease is one with sudden onset and subsidence.

13. *Chronic.*—A chronic disease is slow in development and course.

14. *Subacute.*—A subacute disease is midway in onset and course between the acute and chronic.

15. *Self-limited.*—A disease may be self-limited, as typhoid fever, which runs a certain definite course, which we are not able to cut short.

16. *Senile.*—When incidental to old age.

17. *Infantile.*—When incidental to infancy.

The laity frequently confuse terms which denote symptoms with those which denote a disease, as "the fever," "the dropsy." Persons also speak of having a "touch of a disease" when they mean a light attack. The laity also speak of being threatened with a disease, usually typhoid fever, which, in view of the infectious nature of the disease, is manifestly impossible.

In many diseases the nature and part affected are indicated by the name.

PREFIXES.—The prefix "*a*" signifies absent from, or without, or loss of, thus,—

Anæsthesia—loss of sensation,
Amnesia—loss of memory,
Anorexia—loss of appetite,
Amblyopia—diminution of vision,
Amaurosis—loss of vision,
Ataxia—loss of coördination,
Aphasia—loss of speech.

The prefix "*dys*" signifies difficult, thus,—

Dysmenorrhœa—difficult menstruation,
Dyspnœa—difficult breathing.

The prefix "*hæmo*" signifies blood, as,—

Hæmothorax—blood in the thorax,
Hæmopericardium—blood in the pericardium.

If the morbid condition is one in which there is effusion of water, the word "*hydro*" is used as a prefix, as,—

Hydrothorax—fluid in the thorax.

Hydroperitoneum—fluid in the peritoneum,
Hydrocephalus—fluid in the head.

The prefix "*hyper*" signifies excessive, as,—

Hyperæsthesia—excessive sensitiveness.

The prefix "*para*" signifies abnormal or atypical, as,—

Paræsthesia—abnormal sensation, as formication.

If the morbid condition is an inflammation surrounding a part, we use the prefix "*peri*," as,—

Perinephritis—inflammation around the kidneys,
Perityphlitis—inflammation around the cæcum.

If the morbid condition be one in which there is an escape of air into a cavity, the prefix "*pneumo*" is used, as,—

Pneumothorax—air in the thorax,
Pneumopericardium—air in the pericardium.

SUFFIXES.—The suffix "*æmia*" signifies that the morbid condition is in the blood, as,—

Anæmia—diminution of blood,
Septicæmia—septic matter in the blood,
Pyæmia—pus in the blood.

The suffix "*oma*" signifies a tumor or enlargement, as,—

Fibroma—fibroid tumor,
Neuroma—nerve tumor,
Sarcoma—connective-tissue tumor,
Carcinoma—epithelial tumor.

The suffix "*pathy*" is used in indicating a disease of a part without indicating the nature of the morbid condition, as,—

Encephalopathy—disease of the brain.

The suffix "*itis*" added to an anatomical name signifies an inflammation, as,—

Peritonitis—inflammation of the peritoneum,
Hepatitis—inflammation of the liver.

The suffix "*rhœa*" signifies a flow or transudation of liquid, as,—

Diarrhœa—a flow from the bowels,
Menorrhœa—menstrual flow.

The suffix "*rhagia*" signifies a flow of blood, as,—

Enterorrhagia—bleeding from the intestine,
Metrorrhagia—bleeding from the uterus.

The suffix "*algia*" signifies pain without inflammation, as,—

Neuralgia—nerve pain,
Gastralgia—stomach pain.

If the morbid condition is in the urine, "*uria*" is suffixed to indicate it, as,—

Hæmaturia—blood in the urine,
Albuminuria—albumin in the urine.
Oxaluria—oxalates in the urine.

Changes in Circulation.—A local increase of blood in a part is spoken of as a *congestion*. A general increase is called *plethora*.

A local decrease is an *anæmia*, or now more generally called an *ischæmia*. General anæmia may be due to either one of two conditions:

1. Diminished amount of corpuscles and hæmoglobin.
2. Diminished amount of blood, as from hemorrhage.

Erythema is flushing due to an increased amount of blood brought to one part. *Pallor* is the opposite condition.

The Course of a Disease may in many cases be mapped out into stages, as in typhoid fever.

1. Incubation stage—from the entrance of the infection to the first symptoms.
2. Prodromal stage—when the earliest symptoms appear.
3. Fastigium—or height of the disease.
4. Decline—or defervescence.

Lesions are visible anatomical changes in disease.

SYMPTOMS are the signs of disease:

Subjective—felt by patient.

Objective—seen by doctor.

Before the introduction of modern accurate methods of diagnosis and instruments of precision for that purpose, much greater importance was of necessity attached to the subjective symptoms than is now. For example, previous to the invention of the stethoscope, in 1827, there had been no way properly to study the heart-sounds, and consequently diseases of the heart passed practically unrecognized, unless they presented very advanced symptoms, such as præcordial bulging and marked impulse. The wise physician of those days when his patient complained of his heart diagnosed that he had heart disease, and when the patient did not directly refer his symptoms to his heart the doctor rarely thought of the possibility of that organ's being diseased.

Now, however, the complaints of the patient or the sensations experienced by him are not of nearly so great weight in the physician's eyes as the symptoms which he is able to observe for himself.

Of course, one must ascertain of what the patient complains and consider carefully the history he gives of himself; but his statements are used to serve simply as a guide to the doctor in his own examination.

In many instances the hysterical element comes into prominence in a patient's complaints as to his sufferings. The word "hysteria" comes from *hysteros*, the uterus, and is applied to the curious condition of mind which it signifies because such symptoms were formerly always supposed to originate from uterine disease. It will be found, however, that hysteria is common to both sexes, and the complaints of hysterical patients, if too close attention is paid to them, are a common source of error in diagnosis. Another way in which a patient

frequently misleads the physician in making a diagnosis is through the eagerness with which in his efforts to aid the physician he will answer what a lawyer would call leading questions. For instance, when asked if he has pain he is apt unconsciously to think that the physician believes he has pain and therefore he reasons, again unconsciously, that he must have pain and so replies.

However, the nurse should never fall into the error of undervaluing a patient's complaints. Nurses and physicians also are apt, for the very reason that they see so many hysterical people, or persons who sham complaints from other motives, to become too suspicious, and thus often mislead themselves. If a patient complains of pain it is our duty, as doctors and nurses, to investigate carefully and try to find a cause for his complaint. If we do not succeed in finding any, it is much wiser for us to give the patient what is called a placebo (from the Latin word which means to placate), such as a hot-water bag to the spot or some simple remedy, than harshly to contradict him or seem heartlessly to disregard his complaints. Nine times out of ten he is sincere in his complaints and imagines that the pain is there even if it really is not, and by a little wilful, kindly deception the nurse may retain the patient's trust and confidence and guard herself against (what would be much more hurtful to doctor, nurse, or patient) the disregard of a real complaint instead of an imaginary one.

The personal equation must be carefully considered in listening to a patient's recital of his symptoms, particularly when those symptoms are purely subjective. Of all subjective symptoms the most difficult to estimate fairly is the degree of pain from which a patient suffers. It is undoubtedly true that a small pain produces a reaction in one person that would pass unnoticed in another.

Some, usually men, make light of severe pain from an unacknowledged feeling of pride. Others feel pain to a

less degree, and in rare instances we meet individuals who apparently have no sensations of pain whatever.

People who wilfully sham symptoms which they do not possess are spoken of as malingerers, and such shamming is called malingering. But it must always be borne in mind that hysterical persons are really not malingerers, because they deceive themselves, or are themselves deceived into imagining that they are really sick, whereas the malingerer is one who simulates symptoms for the purpose of deceiving others and is well aware of the fact that he himself is a fraud. Persons who imagine they suffer from complaints when in reality these do not exist, or who exaggerate the seriousness of trivial ailments which they really possess, are spoken of as hypochondriacs, and are commonly said to be "hipped" about themselves. It is really a very serious problem sometimes how to deal with persons who have once become the victim of the hypochondriac habit.

A nurse, unless specially trained in such cases, should not undertake the care of a neurasthenic or hysterical patient in private work. She might act in a subordinate capacity to a nurse of special knowledge in these cases, but should accept even that lesser responsibility only after acquainting the physician in the case of her lack of this particular experience.

TERMINATIONS of diseases are:

1. Recovery,
2. Death,
3. Secondary processes.

Recovery from a disease may occur by lysis or crisis. Crisis is most often seen in acute disease; lysis, in subacute and chronic. Recovery by crisis is the term applied to the sudden disappearance of the symptoms of the disease from which the patient suffers. It is very apt to be accompanied by what are called critical discharges,—namely, sweating, free urination, diarrhœa, and an ab-

rupt fall of temperature, if the disease has been a febrile one.

Lysis is the gradual disappearance of the symptoms of a disease.

A relapse is where, after short convalescence, a disease returns. Recrudescence is where, after subsiding, a disease increases in severity again. We speak of a disease as running a typical course when it presents the symptoms which are characteristic of it, and as running an atypical course when it lacks typical symptoms or presents unusual ones.

There are very few diseases which are at the present time regarded as absolutely incurable when once they have developed, unless the process has advanced too far, but of course using the term strictly it should be confined to disease processes which we are absolutely unable to combat and which will inevitably result in death.

Tuberculosis of the lungs was formerly regarded as an absolutely hopeless disease, and many of the laity still regard it as such. In reality, however, such is not the case, and at autopsies healed tubercular lesions of the lungs are frequently found, perhaps when the presence of the disease had never been suspected.

Carcinoma, or cancer, is another disease regarded as incurable, and it is very apt to kill even when most skilfully treated. Yet many cases, possibly of the breast or, of the uterus, recover after the diseased organ and neighboring glands have been removed. Of course, cancer is prone to recur, and it may be that years after removal the patient will return with another growth, but nevertheless there are many cases in which such a recurrence does not take place, and those cases we are justified in regarding as cured.

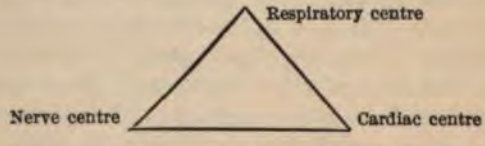
Sometimes, however, we see cases of tuberculosis in which the disease process runs through the patient's lungs like a prairie fire and death occurs in spite of every

measure taken to avert it. This condition is known as galloping consumption.

Likewise there are cases of cancer in which a simultaneous development of cancer nodules in different parts of the body takes place or in which a growth recurs in a short time after its primary removal.

But because a disease is usually fatal, each case of that particular disease need not be regarded as necessarily fatal. It is wrong to let the impression go abroad that a disease is incurable. It exerts a most depressing effect upon the minds of those who suffer from such a disease and often has a strong influence in leading to the production of a fatal result. It is the physician's duty, of course, to warn a particular patient or his family when a disease is really bound to terminate fatally, but that does not necessarily imply that large classes of sick persons should be depressed by the thought that they must die of a disease from which they suffer.

Death may occur from different causes in the course of a disease, but in former times much stress used to be laid on what was called the "vital triangle," which was diagrammatically represented by a triangle with the angles respectively named for the three vital centres, thus,



and death was said to occur from the failure of one or other of the angles of the triangle or from a simultaneous failure of all three. When death occurs from a simultaneous failure of all the centres it is usually termed death by asthenia.

Death may occur from shock, as after an operation or accident, in which case it is due to failure of the ner-

vous system. Deaths from ether are due to failure of respiration, while those from chloroform are due to failure of the heart. In diseases also, one or other of these three vital systems may fail conspicuously. In typhoid fever the heart often gives out at a time when the other systems appear to have the strength to continue the struggle longer. In diseases of the heart it is naturally the heart failure that brings death, though in most cases there is to some extent weakness of the other angles of the triangle as well.

To determine when a person is dead might seem to be an easy task, but sometimes it is not so. Very many people suffer from the dread of being buried alive, and it is easy to imagine with what horror relatives would be seized in a case where they were told that the patient was dead and after that signs of life should be given by the supposed corpse. This is a more common occurrence than is generally supposed. It is not meant by this that burials alive are common; such accidents never occur in ordinary circumstances. They may occur on battlefields, where there is a great deal of haste to bury the dead and those entrusted with the task are not sufficiently skilled, even if they had time to examine, to tell whether death has occurred; or in times of plague, where again bodies are hastily buried, and the fear of contagion is such that those who bury the dead do not risk making a careful examination.

But it is quite an ordinary occurrence to see just after the patient's heart has stopped, or even some minutes afterwards, an apparent effort at respiration. This is due to residual air in the lungs making its escape, but it is very startling and to the relatives who may be present is inexpressibly horrifying. Often such an occurrence will cause them to delay the laying-out of the body, and to remain watching by its side for hours in spite of the best efforts at explanation.

The newspapers frequently contain horrible tales about the discovery that burial alive has taken place in some case in which circumstances have rendered it necessary to exhume the body some time after burial. These tales usually detail how the corpse was found with arms flexed and legs drawn up in a vain effort to escape, the eyes open and staring in affright. If the body was that of a man they usually narrate how the face was covered with a growth of hair.

All these phenomena can be easily accounted for. After death the ordinary chemical changes which occur in the processes of decomposition make the muscles contract in various ways, and thus the limbs become distorted. The eyelids are usually retracted in the course of events, causing the eyes to open, and the wasting or falling in of the muscles and tissues about the orbits cause the eyes to assume a most horrible aspect. The apparent growth of hair is merely an exaggerated description of the appearance which results when the hair follicles at the base of each hair waste and cause each individual hair to stand prominently forth.

Newspapers also occasionally contain accounts of individuals who have fallen into a cataleptic trance and have only awakened in the nick of time to prevent their burial alive. As, however, cataleptics are hysterical, and the cataleptic trance as ordinarily seen is an hysterical manifestation, it becomes easy to explain why the cataleptic invariably awakens at the proper moment, before the coffin lid is screwed down. The cataleptic may be foolish enough to be hysterical, but is not fool enough to be buried alive.

As to the ways of ascertaining when a person is actually dead, the most accurate is to listen over the chest and ascertain whether or not the heart still beats and whether respirations can yet be detected. The laity have many methods of satisfying their minds, the most common

being the placing of a mirror before the mouth or holding a feather in the same situation. After death what is called post-mortem rigidity, cadaveric rigidity, or rigor mortis sets in, and this occurrence conclusively proves the patient dead, but the time of its onset varies greatly. As a rule, it occurs very rapidly after sudden death. Thus, soldiers who have been shot are found standing against trees, or kneeling in the position they occupied at the time the bullet struck them.

In cases in which death has occurred more slowly, as in most diseases, cadaveric rigidity may not set in for some hours.

After death the temperature of the body usually rapidly falls. In many diseases or in many accidental deaths, it has begun falling as the patient's vital powers failed, so that the body soon becomes cold. But in certain forms of death at times the temperature for a few hours after death may ascend and even be higher than it was during the patient's last illness. This is seen in death from cerebral lesions, as in apoplexy and brain tumor. It is sometimes startling, but the phenomenon only lasts a short time and then the body rapidly becomes cold.

Pathological Phenomena.—Before discussing particular symptoms of diseases and their treatments it is necessary to indicate as briefly as possible some of the many phenomena presented by the human organism when in a pathological state, in order that the nurse may, in any particular case, be able to observe intelligently for herself the symptoms, and be able to inform the physician of changes in the patient's condition which it might otherwise not be possible for him to discern. Of course, the nurse is very rarely called upon to make a diagnosis, but that should not interfere with her being possessed of sufficient knowledge to understand how the doctor has arrived at his opinion of a case, and to know what symp-

toms or changes in the patient's condition she must be on the lookout for. A nurse should never vouchsafe a diagnosis to the patient or his friends unless she has been instructed by the physician what to say. When questioned she should refer them to him.

When a nurse undertakes the management of a patient there is much she may learn by observation and tact which the physician may be unable to find out in the course of his daily visits, no matter how careful an observer he may be. When the physician is making his visit, unless the patient is too sick to fully comprehend what is going on, he is apt to behave very differently than when he is left with nothing but his own thoughts and the nurse. Some patients, on the occasion of the doctor's visit, especially if the latter has personally endeared himself to them, brighten up, and are cheerful and intelligent. On the other hand, many patients like to paint their condition to the doctor in the darkest possible colors, and he may be misled into thinking their condition more serious than in reality it is. The nurse, however, has such constant opportunities for observation that she is able to catch them unawares continually, and it generally takes but a short time to size them up and learn whether they are malingering or are hysterical, or whether their manner is natural and unassumed. Of course, the nurse should not let the patients think that they are being constantly watched or having traps laid for them. That would be merely to make them angry or put them on their guard.

Diagnosis is the art of determining the condition from which a patient is suffering, and is to very many the most interesting side of medical study. It is an art which can be cultivated to a very wonderful extent, and in those so skilled we frequently see results arrived at that seem little short of marvellous where the so-called "medical instinct" has aided the commoner methods of obser-

vation and deduction. The importance of diagnosis must be apparent to all when we consider that all treatment of the case must necessarily hinge on its proper recognition and classification. Diagnosis of some conditions is extremely simple and of others well nigh impossible. To the most skilled and best trained thinkers errors of diagnosis occasionally occur, and in no way are these errors to be held up in judgment by either physicians or nurses. The nurse's responsibilities have nothing to do with this side of a case. They should confine themselves to the reporting most carefully of each and every symptom without allowing their own opinions of the value of these symptoms to in any way affect the report.

Prognosis, meaning knowing before, is the art of predicting the outcome of disease. This is also a most difficult side of medicine, and it is a not uncommon circumstance to see men alive and hearty who had been consigned to early graves years previously by their physicians through an error in prognosis.

There are many things which must be considered in making a prognosis: Age of the patient; condition before attack; sex; race; disposition; severity of attack; surrounding conditions and a variety of such data which are often confusing in themselves and help to add to the difficulties. This it is that makes physicians so careful in giving prognoses.

In all cases the observation of the nurse should prove of value to the physician, particularly so in obscure cases and where this observation is intelligently trained.

Subjective symptoms should be reported by the nurse as nearly as possible in the words of the patient, without being colored by her own opinion.

The most prominent subjective symptom, as already stated, is pain, and should be studied in regard to, first, locality; second, nature; and third, time of occurrence.

1. Locality: Angina pectoris.—Pain in the heart radiating down the left arm.

Headache.—Pain low down in frontal region is usually due to eye-strain. Stab-like pain on top of the head is a symptom of hysteria; headache is unilateral in migraine and sometimes in brain tumor.

Gout.—Pain in the big-toe joint coming on after midnight.

Girdle pain.—Girdle pain is a feeling of constriction about the body, most frequent in locomotor ataxia.

2. Nature: Pain may be—

Dull,
Sharp,
Sticking,
Continuous,
Throbbing,
Lancinating (as in cancer and locomotor ataxia),
Slight,
Severe.

3. Time: Time at which it is worse,—as at night, in bone pains of syphilis.

Whether relieved or increased by—

Change of position,

Pressure—colic is relieved, while an inflammatory trouble, such as appendicitis, is made worse.

Certain dyspeptic pains are relieved by food.

Often pain is referred to some point far distant from the real lesion. This is explained by the branching of a nerve or nerves which are concerned in the supply of both the part affected and the point to which the pain is referred. Referred pain often gives rise to more or less serious errors of diagnosis. The pain of early hip-joint disease is often referred to the inner side of the knee on the affected side, and sometimes we see little patients brought to the hospitals with bandages and

dressings about the knee when in reality the hip-joint is diseased and the knee not at all.

Pain in a dislocated shoulder sometimes is felt at the elbow; pain in perforation of stomach is sometimes felt in the shoulder or back of the neck. After amputation of a limb pain is sometimes felt in the course of the nerves which formerly supplied the fingers or toes which have been removed, and the patient refers the pain to those extremities and complains of the sensations in fingers or toes. There is a superstition among the ignorant that these pains will always arise in a stump unless the fingers or toes of the amputated limb are straightened out in burial.

Objective.—As opportunities present themselves the nurse should inspect or observe the patient's body and limbs. This is a particularly important part of her duties if the patient is unconscious.

The patient may be well nourished or wasted (emaciated), obese or thin. The muscles may be firm or flabby.

She should in her examination note the presence of skin eruptions or discolorations which may be due to eruptive fevers; syphilis; leprosy; or to certain drugs, such as belladonna and bromides; miliaria, or prickly heat; rhus poisoning; urticaria, or hives; contusions, purpura rheumatica.

Prominences, or swellings, or local inflammations may be noticed:

(*a*) Tumors—Carcinoma (breast),
Sarcoma (neck).

(*b*) Glandular swelling—Tubercular (neck),
Syphilitic (in the groin or in post-cervical region).

(*c*) Abscess—May occur in glands or elsewhere,
Cold abscess: psoas abscess points below Poupart's ligament.

Spinal abscess, appears on either side of the vertebral column, and is often the first indication that a disease is tubercular.

(*d*) Scars of—

Operations,
Injuries,
Suppurations.

A patient may neglect to state anything about the cause of a scar until it is observed and he is directly questioned about it.

(*e*) *Deformities.*—Often the sick-bed reveals a deformity which some poor wretch has passed his life endeavoring to conceal.

(*f*) *Dropsical effusions*—œdema of the abdomen or legs.

(*g*) *Bed-sores*—especially if illness has been of long duration; and if such has been the case it is well, as soon as possible after taking charge of a case, to search for this complication. Patients do not notice the occurrence of the sore, but the symptom is a grave one, indicating, as it frequently does, extreme asthenia. At all times bed-sores are difficult to heal, because they usually occur in localities which are exposed to constant pressure, and they also constitute a great drain on the patient's strength.

(*h*) *Ulcers.*—Leg ulcers are often a symptom of syphilis, especially when occurring on the anterior upper surface of the tibia. A patient may have had an ulcer for a long time and not deem it worth mentioning, yet if discovered it may furnish the doctor an important clue to diagnosis. Generally leg ulcers are due to the neglect of an abrasion or contusion of a leg already devitalized by faulty circulation consequent upon varicose veins.

Cough, when present, should be noted as being—

Worse by day or night,

Dry or accompanied by expectoration,
Painful,
Frequent,
Loud or ringing whoop.
Whether noticeably influenced by position or remedies.

Nausea and vomiting must be noted as to—
Time of occurrence immediately after meals, or in the morning.
Nature of vomitus—Food,
Bile,
Blood-streaked,
Coffee-ground — cancer, yellow fever,
Fecal or stercoraceous—intestinal obstruction.

Appetite must be observed:
Absence of appetite—anorexia.
Amount or character of food taken,—
Bulimia—excessive appetite,
Pica—perverted appetite.

Abdomen may be—
Distended or swollen; locally or generally:
Hernia (localized) umbilical,
inguinal,
Tumors,
Intestinal obstruction,
Dropsy,
Flatus,
Dropsical accumulation,
Ascites.

When the abdomen is distended with gas the note given out on percussion is resonant, while if fluid be the cause of distension the note is dull.

Often the patient's position in bed (*decubitus*) will

furnish us with an important clue in diagnosing his condition.

For instance, in dyspnœa due to heart disease the patient sits upright in bed day and night. In cardiac aneurism he leans forward.

In pneumonia and pleurisy affecting one lung the patient usually lies upon the affected side, as it is painful or impossible for him to breathe with the diseased side, and he unconsciously lies with the healthy side up, so that it may expand as much as possible, and at the same time uses the bed as a splint. In peritonitis or abdominal inflammation and appendicitis, the patient lies with legs drawn up to relax the abdominal muscles. In flatulent colic he lies on the abdomen because the pressure relieves the pain. In conditions of extreme weakness nature bids the patient store up his energy and he lies quiet, hence when in an asthenic disease the patient voluntarily begins to make a few movements it is a good sign. But this favorable sign is not to be confounded with the restlessness, tossing about (jactitation), which is seen in so many cases as the death agony commences. The patient may manifest what are called choreic movements, which are usually readily distinguished from jactitation, because in the latter the patient throws himself from one place in the bed to another, whereas in chorea we see only a localized muscular spasm, or a number of localized muscular spasms except in very grave cases. In hip-joint disease and psoas abscess the thigh cannot be fully extended on the bed.

Carphologia, picking at the bedclothes, seen in typhoid fever, subsultus tendinum, jumping of tendons, also seen in typhoid fever, and hiccough are all symptoms indicative of a very grave nervous condition.

The patient's *mental condition* must be observed carefully. Thus, it may be normal or depressed (sometimes the latter amounts to a true melancholia), or he may be

apathetic or anxious or excited, hysterical, irrational (or wandering), delirious, or unconscious.

It will not do to jump at a conclusion as to the mental state of our patient until he has been carefully watched for a length of time, particularly is this true as to judging whether the patient is hysterical or not.

We must note whether *sleep* is normal: the duration of time in which the patient sleeps: whether the sleep be restful or easily disturbed: whether the patient cries out in sleep (hip-joint disease and meningitis). We cannot take the patient's word as to the amount of sleep. Note must be taken whether the patient sleeps with the mouth open or not. Recurring nightmare is sometimes a sign of nasal obstruction. Nightmare is ordinarily a result of indigestion.

The voice may be normal or raucous or hoarse, as in diseases of vocal cords (tubercular and syphilitic).

Lost voice, or aphonia, may be present in hysterical conditions or due to a tumor of the larynx, paralysis of vocal cords from inflammation, or pressure on nerves from an aneurism or tumor, as, for instance, aneurism of the aortic arch pressing on the left recurrent laryngeal nerve which winds around the aorta.

Speech may be clear or thick. The latter is seen in paralysis of any parts concerned in speech, as after apoplexy when the cheek and tongue are paralyzed, or when the tonsils are hypertrophied or inflamed.

Lost speech, or aphasia, may result from apoplexy, brain tumor, brain abscess, or paralysis of vocal cords.

The hydrocephalic cry, heard in hydrocephalus and meningitis, and the night cry of hip-joint disease are sudden, sharp outcries heard in children at night, and may be very early indications of one or other of these grave conditions.

The *facies*, or facial expression, may be—

Normal,

Drawn, as in pain,
Paralyzed (squint, or ptosis),
Wasted (marasmus),
Swollen (mumps, abscesses, erysipelas),
Puffy under eyelids (nephritis and heart disease from dropsical effusion).

Complexion may be—
Pale, as in anæmia,
Florid,
Cyanosed,
Waxy, as in Bright's disease,
Yellow, as in jaundice,
Flushed, unilateral, as in one-sided pneumonia,
Bronzed, as in Addison's disease.
Eruptions may be present.

Skin is—
Dry, as in fever,
Moist, as in shock,
Hot, as in fever,
Eruptions are often present.

Lips may be—
Blue, from cold or from cyanosis due to respiratory distress, as in cardiac dyspnœa, pneumonia, emphysema, and other conditions,
Parched or dry, in fever,
Fever blisters, in fever,
Rhagades (fissures) at the angles of the mouth in the new-born are indicative of hereditary syphilis.

Eyes may be—
Sunken, as in wasting disease,
Prominent, as in exophthalmic goitre,
Inflamed lids.

Pupils may be—
Equal or

Unequal, the latter being seen in apoplexy, meningitis, and other conditions.
Equally dilated from drugs, such as atropia, or from some cerebral conditions,
Equally contracted by drugs (opium) or from meningitis or other cerebral lesions,
Squint is seen in meningitis or meningeal irritation.

Tongue may be—
Furred all over or clearing at the edges,
Beefy and large, as in diabetes,
Scarred in epilepsy,
Partially denuded of epithelium in intestinal diseases,
Strawberry, as in scarlet fever,
Ulcerations may be present in mercurial poisoning, stomatitis, or syphilis.

Throat.—
Red in simple sore throat, or in scarlet fever,
Granular, in chronic pharyngitis,
Membranous, in diphtheria and scarlet fever,
White spots on tonsils, in tonsillitis, also patches of exudate resembling membrane, in same condition,
Ulcerated, in syphilis or tuberculosis,
Bulging forward of pharynx in retro-pharyngeal abscess, and forward and toward median line in tonsillar abscess,
Soft palate may be spotted with measles eruption before signs on the skin appear.

Gums may be—
Swollen, tender, spongy, and bleeding in stomatitis or gingivitis,
Blue line may be present on the edge of the gums in lead, mercury, and bismuth poisoning.

Teeth when false are sources of danger in case of delirium or administration of an anæsthetic.

Sordes collect on the teeth in febrile conditions.

The teeth are notched or pegged (so-called Hutchinson's teeth) in hereditary syphilis.

The patient's *subjective symptoms* as regards the organs of special sense are of much importance; for instance, the

Eyes.—

Photophobia, or sensitiveness to light, is seen in meningitis and brain lesions,

Squint,

Lachrymation is often a forerunner of measles,

Failure of vision in brain lesions and eye conditions,

Muscæ volitantes, or spots before the eyes, occur in run-down conditions.

Nose.—Loss of smell is a common accompaniment of a nasal cold.

Hearing may be lost altogether or merely impaired from some middle-ear disease occurring in the course of an infectious fever or due to some affection of the auditory nerve.

The abdomen is often scaphoid, or hollowed out, in wasting diseases, such as marasmus or meningitis.

Gurgling in the right iliac fossa is commonly present in typhoid fever. Such gurglings are called borborygmi.

Sensations of heat may be due to fever, to a localized inflammation, or to the changes incident to the menopause. These latter sensations are described as flashes of heat, which last but a short time and seem to come all over the body like a wave.

Cold sensations often overtake a patient as death approaches. Sometimes they are experienced after reduction of a high temperature. Objective cold is felt over a gangrenous part or where the circulation is faulty.

CHAPTER II

EXCRETIONS

MUCH valuable information may be gleaned from observation of the various excretions of the body, and often a diagnosis may be made on just such observation.

Fæces—Urine—Sputum—Vomitus.

FÆCES.—Soft, yellow, and liquid or resembling pea soup:	In typhoid fever or when milk diet is exclusively taken.
Light clay-colored, usually formed and hard:	In jaundice.
Small, watery, mucous, blood-streaked or blood-mixed:	In dysentery and in corrosive poisoning.
Rice-water like:	In Asiatic cholera.
Green, slimy with particles of curded milk:	In intestinal indigestion of infants.
Blood clots, blood and thin fæces:	In hemorrhage from bowel in typhoid fever.
Undigested fat in stool:	In pancreatic disease.
Dark brown or black in color:	When taking bismuth or iron or when there is hemorrhage from a point high up in duodenum or stomach.

Intestinal parasites should also be looked for—round worms, thread worms, and segments of tapeworms.

THE URINE in health is clear, usually acid in reaction, and of an amber color. Within the limits of health, however, there may be certain modifications. For instance, if much fluid, particularly beer, be consumed, the urine is paler in color and lighter in weight. Not infrequently the urine is alkaline directly after meals. After violent exertion with free sweating the urine is scant in amount and high in color, due to the abstraction of fluid in the sweating process.

Urine is scanty, dark, high colored:	In fevers and after violent exercise and free sweating.
It is scanty, dark, high colored, and cloudy:	In acute Bright's disease when it is apt to contain blood and kidney cells and be concentrated.
Pale and of light specific gravity, quantity greatly increased:	In chronic Bright's disease of the fibroid type,—*i.e.*, where there is contracted kidney. In other forms of Bright's disease nothing characteristic is noted.
Urine is light yellow, sweetish or aromatic to smell, greatly increased in quantity, high in specific gravity and liable to cloud on standing from formation of fermentation spores:	In diabetes mellitus.
Pale and of low specific gravity, but of increased amount:	In diabetes insipidus.
Cloudy from presence of mucus, pus, and débris, perhaps blood-cells and epithelial cells; alkaline in reaction and of a strong ammoniacal odor:	In cystitis.
Cloudy and contains mucus, leucocytes, few red cells and débris:	Normally during menstruation.
High colored and of brownish yellow tinge due to presence of bile:	In jaundice.
Dark red from much blood, or is nearly all blood:	In hemorrhagic diseases, purpura, hæmophilia, or malignant disease of bladder.

There are changes in the urine in addition to those mentioned, though of minor pathological importance, such as the deposit of bright-red or reddish-yellow dust like particles of uric acid in urine which has stood a while. This is due to an excess of uric acid. Urine that

is loaded with urates becomes very cloudy after it has remained in a cold room.

Finally, certain drugs influence the urine in one way or another.

Turpentine imparts an odor of violets.

Carbolic acid and derivatives,—Salol:	Smoky urine,—odor of carbolic acid.
Methylene blue:	Makes the urine blue in color.

SPUTUM.—Normally, sputum consists of saliva; sometimes, however, in catarrhal people or in smokers who inhale tobacco smoke into the bronchial tubes there is a certain amount of thick white or grayish mucus coughed up from the bronchi and expectorated, particularly in the morning.

In nasal catarrh, a very common affliction, mucus and muco-pus are drawn from the nasopharynx and expectorated as a yellowish, thick, adhesive mass.

Sputum is—

Thick, yellowish, profuse, or under certain conditions where there is dilatation of a bronchus a large quantity of foul-smelling expectoration will be coughed up when perhaps there has been none for some time:	In bronchitis.
Blood-streaked, prune-juice like, or thick rusty in color and very tenacious: a pathognomonic sign of pneumonia:	In pneumonia.
Thick, yellow, profuse or scanty—nummular or ball-like when cavities are present in lungs:	In pulmonary tuberculosis or consumption.

Greenish or grayish yellow in color, large in amount and of a peculiar sweetish sickening odor:	In gangrene of lungs.
Large in amount, yellow and purulent:	In abscess of lung.
Blood streaked and frothy:	In congestion of lungs.
Dark, black, or black specked:	In coal miners.
Frothy blood:	In hemorrhage from lungs.

VOMITUS—contains undigested contents of stomach:

Mucus or mucus and bile if vomiting continue after stomach is void of food:	In acute indigestion from over-eating or alcoholism (acute), or any of the numerous causes of this affection.
Mucus before breakfast:	In chronic alcoholics and in pregnancy.
Curdled milk:	In infantile dyspepsias.
Very large quantities of food that has collected in stomach for a long time:	In dilated stomach.
Coffee-ground-like masses mixed with mucus:	In cancer of the stomach.
Blood-streaked mucus, blood clots or fresh liquid blood:	In gastric ulcer.
Blood streaks:	In irritant poisoning, congestion of stomach in heart disease, etc.

Vomiting is forcible or projectile in meningitis, brain tumor, and cerebellar disease. Unnecessarily loud and strained in hysteria, though sometimes also the reverse, being silent and without effort.

CHAPTER III

Temperature—Pulse and Respiration.

TEMPERATURE

It is a well-known fact that our bodily temperature is higher than that of the surrounding air and that we are what are called warm-blooded animals as opposed to cold-blooded animals. *Warm-blooded* animals are animals which possess a certain normal height of temperature which is higher than the temperature in which they live, and is not markedly altered by changes of the surrounding temperature. *Cold-blooded* animals (reptiles) have a temperature which changes with that of the surrounding atmosphere. Our average temperature is about 98.2° F. or 37.5° C., with certain variations slightly above or below this level within the limits of health. This is maintained as a nearly even standard even during a summer temperature of 100° F. or a winter temperature of zero.

The temperature at which the heat of our body is maintained is the result of the chemical changes which are constantly occurring in our tissues. The ordinary combustion which takes place in a fire is a form of oxidation, and just so tissue changes are another form of oxidation; all forms of oxidation are accompanied by the generation of *heat*, so that whether it takes place in a fireplace, or within ourselves, oxidation always results in heat production. The fire in the grate produces, as a result of the oxidation of coal, CO_2, just so the oxidation of our tissues produces CO_2, the difference being the oxidation in our tissues is a very slow process and that in the fireplace an extremely rapid one.

The degree of temperature therefore of a warm-blooded animal is not in reality as dependent upon the temperature of the surrounding atmosphere as it is upon the chemical changes going on in his own organism. When oxidation is being very actively carried on within us, we find our temperature correspondingly elevated, and when oxidation in the organism is at a low ebb, we find the temperature of the organism also depressed. Thus during exercise oxidation is increased and our temperature raised. On the other hand, during sleep oxidation is sluggish and our temperature falls. Oxidation is rapid after the ingestion of food, during the processes of digestion and assimilation, and consequently at that time the bodily temperature is elevated.

Of course, the chemical changes which occur in the oxidation of our tissues result in the destruction or, so to speak, burning up of those tissues, and this necessitates a constant supply of fuel in the shape of food, and we find that persons who eat heartily and assimilate their food properly are usually those whose bodily heat is so well maintained that they suffer but little from extremely low temperature. Fat persons have a larger supply of tissue for oxidizing and the resultant formation of heat, and largely for this reason they withstand cold weather much better than lean persons do, and besides this their layer of subcutaneous fat prevents the warm blood from cooling on exposure to the external temperature.

In considering the maintenance of the average temperature of our bodies we must bear in mind the constant loss of temperature to which we are subject. The heat we generate within ourselves is used for other purposes than that of maintaining our bodily temperature. It is used to warm the air we breathe as it passes through the nose and throat so that it shall be properly warmed by the time it reaches the lungs. It also warms our

food and drink. Then also heat is constantly radiating from the surface of our bodies, because they are as a rule warmer than the surrounding air, and a cold space will become warmed simply by radiation from persons who are within it and from their expired air which has been warmed within their bodies.

The temperature of the body is ascertained by the clinical thermometer. There are many varieties of this little instrument, some of which register the temperature after a half minute's exposure to the heat of the body, but the most commonly used thermometers require an exposure of from one to three minutes. In using a thermometer one should be sure of its accuracy, and to ascertain its correctness it should be compared with a standard instrument. It is well to repeat this testing at intervals of a few months, as variations from the standard may occur in the very best makes of thermometers. The temperature is generally taken by the mouth, and in that locality it is normally found to be 98.4° F. The temperature may be taken in the rectum, in which case it will be a little higher, or in the axilla, when it will be somewhat lower than 98.4° F. Sometimes the surface temperature of the body is taken by placing a thermometer on some part of the exposed skin. This surface temperature is normally lower than that in the axilla, mouth, or rectum. In certain pathological conditions, as when there is local inflammation, it is elevated, and in others, as when a part is gangrenous, it is depressed below the normal.

In taking the temperature by the mouth we must be sure the lips are kept closed during the time in which the temperature is being taken, as otherwise the temperature in the oral cavity becomes lowered. Some persons claim to be able to raise the thermometer reading by pressure on the bulb with the lips.

The axillary temperature is usually three-tenths of a

degree lower than that in the mouth. The axilla is a most convenient region for ascertaining the temperature when the patient is asleep, or when he is delirious and there is danger of his breaking the thermometer. If there is much perspiration in the axilla it should be dried before inserting the thermometer; then the arm is laid across the chest and held in that position while the temperature is taken. The irregularity of the opposing surfaces in the axilla sometimes tends to interfere, though in very slight degree, with the accuracy of the temperature reading at that point.

The rectal temperature is usually one-half degree higher than that in the mouth. It is the most accurate method of estimating the bodily temperature because there is not the same chance for the thermometer to change its position as there is in the mouth, and the opposing bowel surfaces do not present the irregularities of surface of the axilla. Often the temperature may conveniently be taken in the groin in children.

The bodily temperature not only varies with the locality at which it is taken but also with the time, in the twenty-four hours. The bodily temperature is lowest in the early morning, about 2 A.M., that being the time at which all vital activities are at their lowest ebb. There is then a gradual ascent throughout the day until about 5 P.M., when it reaches its highest point in the twenty-four hours, and again declines. The variation is only a fraction of a degree.

Age affects materially the normal bodily temperature. In infancy and childhood the temperature as a general rule is one-half to one degree higher than the average adult temperature, and we find at those periods of life that it is much more subject to fluctuation, much less stable, than it is in adult life. A slight attack of indigestion, or a slight cold, will elevate the temperature of a child to an alarming extent, whereas such disturbances

in an adult produce but very slight effect upon the temperature. This is because the child's whole organism is in a less stable condition of equilibrium than the adult's, his vital processes have not settled down to the routine work of life, and any disturbance of his functions is calculated to throw his system out of balance, so to speak. We see this in every action of the child. He blushes and flushes more easily than the adult; his muscles, everywhere, do not perform their work with the same coördination as those of an adult; his mental processes are not so well governed. In old persons the temperature is usually found somewhat lower than the normal average. Their vitality is lower than in middle life, their circulation is not as active, and their tissue changes are not carried on with the same vigor.

There are yet other circumstances which affect the normal temperature in conditions of health.

Temperament has much to do with the temperature of the individual; thus, phlegmatic persons, as a rule, have a temperature not easily affected by slight circumstances, but persons of neurotic temperament, on the other hand, are liable to be thrown into a febrile condition by very trivial disturbances. There are some rarely constituted persons whose temperature is constantly somewhat below normal and in whom an elevation of temperature to 98.4° F. would signify a febrile condition. After *eating* the bodily temperature is generally elevated. In this connection the old saying, "If you eat till you're cold, you will live to be old," might be cited. This saying owes its origin to the fact that after a very hearty meal the blood is diverted from the surface of the body to the digestive organs, for the purpose of digestion, and this gives rise to a sense of chilling of the surface.

The character of what is taken as food or drink has a marked effect on temperature. Thus alcohol, tea, and

coffee (the stimulants) produce an elevation of temperature. Cold foods have the reverse effect.

The temperature is lowered by *cold bathing*, though the subsequent glow produced by it is accompanied by an elevation of temperature. *Profuse* perspiration is accompanied or followed by a fall of temperature. Of course, if the temperature of the surrounding atmosphere is very low, even the most warm-blooded animal may experience some lowering of the bodily temperature, and, *vice versa*, if the surrounding atmosphere is very high, there will probably be also somewhat of an elevation of the bodily temperature.

Mental condition has much to do with the temperature level. Great excitement will frequently result in a quite surprising elevation of temperature. It is a matter of common observation how a patient suffering from typhoid will have his temperature run up alarmingly if he experiences anything to excite his mind. The same thing prevails in health, though in a much less marked degree. On the other hand, mental apathy is apt to be accompanied by a somewhat lowered bodily temperature. This is seen in insane patients, especially when suffering from the passive stage of melancholia. They get into a condition of apathy and all their functions become sluggish and we see a corresponding temperature depression.

All these variations of temperature produced under different circumstances when the temperature is taken in healthy individuals should make it incumbent on the nurse to bear them in mind when taking the temperature in pathological conditions, and for these reasons she should in observing a given case be aware of the locality and method in which the temperature was taken, and also the hour of the day, and other circumstances which may affect the judgment in that individual case. The minor variations of temperature already mentioned as occurring in a state of health become much more marked

in conditions of disease. Thus we learn to take the temperature at certain fixed corresponding hours in the twenty-four throughout the course of a disease, and this is the reason why all temperature charts provide for the careful registration of the time when the temperature was taken. Thus, account must be taken of the locality at which the temperature was registered. It must not be taken at one time in the mouth, at another in the axilla, or at another in the rectum, without making note of the change of locality, as allowance must be made for the always present variations of temperature in those different regions.

The temperature should never be taken by mouth in delirious or comatose cases owing to the risk of the patient biting the thermometer and swallowing the mercury and glass. In cases where for any reason there is shortness of breath the mouth should not be selected because of increased discomfort to the patient or inaccurate findings where the patient is so dyspnœic as to be forced to breathe to some extent through the mouth.

There are various terms applied to the condition of the temperature, thus, by mouth:

98.4° F.—normal,
98° F.—subnormal,
100°–105° F.—pyrexia,
105° F.—hyperpyrexia.

A temperature of 105° F. is usually an indication of extreme gravity and shows the necessity for active measures for its depression. One hundred and nine to one hundred and ten degrees temperature are rarely seen except in sunstroke, and occasionally in brain tumors and spinal meningitis or tetanus, and a fatal result generally ensues.

In regard to the danger of elevated temperature much

depends upon the nature of the disease from which the patient suffers and upon the duration of time in which the temperature remains elevated. Thus, a man with sunstroke, if his temperature is 105° or 106° F. is not the subject of as grave a prognosis as he would be if his case were one of typhoid, where the fever range extends over a much longer period than in the case of sunstroke.

The duration of the time in which the temperature remains elevated has much to do with our prognosis as to its results. A very high degree of hyperpyrexia may be maintained for a short time without inflicting serious damage to the patient, whereas a lower degree of temperature maintained for some length of time will produce great harm. The highest elevations of temperature are to be met with in sunstroke and in diseases of the spinal cord, and among the latter especially in tetanus. A curious fact frequently observed in this disease is that the temperature is apt to continue to ascend for a short time subsequent to death. In a case under the care of the late Dr. Ashhurst it was 112° before death and 113° F. one hour later. A curious fact about these patients who die of such excessive temperature is that rigor mortis sets in early, because the extremely high bodily temperature results in coagulation of the myosin of the muscles.

If recovery follows these very high temperatures, especially in sunstroke, the temperature balance is often deranged so that subsequently disturbances of temperature are easily provoked. Patients who have once had a sunstroke suffer intensely from the heat and sometimes suffer a second stroke.

Death from hyperpyrexia may occur from exhaustion, the patient being as it were "burnt up" by the intensity of the febrile reaction in his tissues, or from failure of heart or respiration.

Temperature descends from abnormal elevations either by lysis or crisis, gradually or abruptly.

Fever is spoken of as continuous, intermittent, or remittent in type, according to its course.

A continuous fever is one where the temperature remains more or less evenly elevated during the course of the disease it accompanies. An intermittent fever is one where the temperature frequently descends to normal and again resumes its course.

A remittent type is one where the fever periodically lessens but never reaches the normal in its descent.

Patients suffering from a severe continued fever sometimes develop a "typhoid" state, with furred tongue, glazed eyes, dry, hot skin, rapid, feeble, compressible pulse, and low, muttering delirium.

Low temperature occurs in pathological states as follows:

It is apt to follow descent from a high temperature, as in a fever terminated by crisis.

In the various forms of anæmia and in traumatic anæmia.

In melancholia and other forms of depressed insanity.

Certain acute diseases are accompanied by what is called an algid stage, as cholera (Asiatic cholera, cholera morbus, cholera infantum).

Low temperature occurs in typhoid as a result of hemorrhage and perforation; also after rupture of an abdominal abscess, as in appendicitis.

The pathology of death from exposure to cold (freezing) is not clearly understood, but is supposed, if the exposure to cold is sudden, to be due to cerebral anæmia, depriving vital cerebral centres of blood, which is sent to the periphery in nature's response to the call for warmth from the surface of the body. If the exposure is slow and continuous, death is probably the result of cerebral

[redacted]

[redacted]

[redacted]

Kidney disease,
Gout,
Diabetes,
Lead poison.

A low-tension pulse is a sign of weakness and exhaustion.

VOLUME must be noted. In a pulse of small tension, often the volume is large. In peritonitis the pulse is apt to be small, hard, and rapid.

In febrile conditions the volume is large.

RHYTHM.—Alterations in rhythm are of two kinds, intermissions and irregularities. An *intermitting* pulse is one that skips a beat occasionally. This skipping of beats may occur regularly or irregularly. It is not diagnostic of any disease, but usually is associated with functional disturbance of the heart due to tea, coffee, or tobacco poison.

Irregularity of heart action may be of several kinds: especially in time, force, or volume. Irregularity of time occurs frequently in valvular heart disease, and is sometimes associated with intermission. Irregularity in force is frequently present in heart diseases. Several successive beats may be of different volume or of different force. This is sometimes seen in poisoning from digitalis.

The *frequency* of the pulse is of great importance. As a general rule, the pulse rate increases ten beats for each degree of temperature above normal. A striking exception to this rule is the pulse in typhoid fever, which is slower than the temperature justifies. Therefore it is of importance to see that the pulse is taken at a time when the patient is free from excitement and has not been exerting himself.

The pulse in scarlet fever is exceedingly rapid from the onset (120–160), and is suggestive of a diagnosis before the eruption appears.

The pulse in aortic stenosis is slow and retarded and of small volume.

In all other valvular diseases of the heart the pulse is increased in frequency. In the terminal stages of all, the heart-beat is generally increased and irregular and often cannot be counted.

The most typical pulse is connected with aortic regurgitation, and is called Corrigan or trip-hammer pulse.

The pulse of peritonitis is hard, wiry, and rapid (140-160).

The pulse in Graves's disease is very rapid. The pulse is also exceedingly rapid in some hysterical conditions.

Slow pulse is present in meningitis and tumors of the brain, and is also observed when the full effect of digitalis is obtained. In convalescence, in melancholia, fatty heart, and acute nephritis, unusual conditions are sometimes noted, such as the occurrence of two beats of the pulse to one of the heart, and the opposite, one pulse-wave for every two heart-beats. Where suspicion of such a state arises, pulse-beat and heart-beat should be simultaneously counted.

With the study of the rate, volume, etc., of the pulse, note should be made of the condition of the radial artery, whether tortuous or straight, visible or invisible, hard or soft. If abnormality of such sort be noted in the radial the temporal artery should also be examined with the same object. A soft, normal radial and temporal does not prove the nonexistence of arterial disease in other vessels, as in the aorta, for instance, which is the most common seat of arteriosclerosis. A hard radial, however, may be taken as meaning general arteriosclerosis of greater or less degree. Arcus senilis (senile arc) is the term applied to the whitening of the cornea at its margin, due to fatty degeneration of corneal cells and generally associated with arteriosclerosis.

RESPIRATION

Normal respiration is silent, easy, and regular. There are two general types of breathing,—the costal, where the intercostal and accessory muscles of respiration are chiefly active, and the diaphragmatic or abdominal, where the diaphragm is the important factor. Usually normal breathing partakes of each type, though in women the costal type predominates, particularly if the action of the diaphragm is hindered by tight corsets, while in men the breathing is more abdominal.

Respiration in normal adults should range between 18 to 22. In children it is slightly more rapid,—22 to 25, while in the infant it may be between 30 and 35.

The rate of respiration bears an uncertain ratio to pulse and temperature, and may be increased with increase of frequency of the other two. Respiration is best taken by placing the hand over the junction of the thorax and abdomen anteriorly and at the same time using the eyes to verify the count. Errors in obtaining a truly representative count may arise from emotional disturbances, cough, restlessness, or struggles to resist. Particularly may any of these causes obtain in the case of children. In the new-born a respiration rate of 60 and over is held by some to be pathognomonic of pneumonia.

Respiration is studied in regard to its rate and character.

Rate.—In conditions where pulse and temperature are accelerated we expect some slight increase of the respirations, although there is no fixed ratio.

Respiration is markedly increased in frequency in pneumonia, phthisis, and in asthmatic conditions.

In conditions affecting one side of the chest or one lung, evidence of respiration may be diminished or even absent on the affected side, particularly in cases of large, unilateral pleural effusions. Respiration is also rapid

in cardiac conditions due to congestion of the lungs, and may be exceedingly so in hysteria.

Slow respiration is seen in opium poisoning, meningitis, brain tumor, and uremia.

Character.—Respiration is subject to various modifications. In pneumonia, particularly in children, expiration may be accompanied by a peculiar smothered grunt which is often diagnostic. In asthma there is prolonged, noisy, wheezing expiration, the difficulty being to get rid of the air which is readily inspired.

The breathing in diphtheria, where the membrane and swelling diminish the calibre of the air-passages, is the reverse of the type just mentioned, and inspiration is carried on with difficulty, often accompanied by a croupy sound. This kind of breathing is also present in any condition where pressure either from aneurism, mediastinal tumor, or tubercular growth may be exerted on the larynx, trachea, or large bronchi. If the obstruction, from whatever cause, be sufficient in degree, the phenomenon of sucking in will be observed,—*i.e.*, the accessory muscles of respiration will be hard at work, the abdomen will be strongly retracted, and the suprasternal notch and the sternomastoids seen to contract with each inspiratory effort. The breathing in croup is that of inspiratory difficulty, with a hard, ringing, croupy cough added. Breathing in conditions of œdema of the lungs is accompanied by coarse, audible, bubbling râles, and the so-called death-rattle is produced by the collection of mucus in the pharynx when a patient is too weak to either swallow or spit it up. The term Cheyne-Stokes has been given to a type of respiration which occurs in many diseases and is always to be regarded as a very grave danger signal. The peculiarity of this type consists in a ladder-like course of the respiration. Beginning gently, each succeeding respiration is louder and deeper than the preceding one, until, after six, seven, or

more are taken, the course is reversed and respirations grow lesser and lesser and finally cease for a period of one-half to one minute. Many observers among nurses do not know just what Cheyne-Stokes breathing is, and often make the mistake of applying this term to jerky and irregular respirations, following no particular type. Respiration may be shallow or deep, irregular, stertorous, or snoring, and modified by such sounds as flapping of cheeks and lips where such be paralyzed.

CHAPTER IV

Hemorrhage—Vaccination—Inflammation—Medical Emergencies, and Poison Cases.

HEMORRHAGE

Bleeding may occur from vein, artery, or capillaries. When a vessel is ruptured or cut it retracts and the lumen narrows, thus favoring the formation of clot, the closing of leak, and the cessation of hemorrhage. In cases where the loss of blood is great, fainting may be a result and favor clotting by the *slowing* of the blood-current and decrease of blood-pressure. External hemorrhage may be checked by pressure, by heat or cold, and, in the event of these means failing, by ligation of the bleeding vessel. Internal hemorrhages are treated by absolute rest and the application of cold over the area from which the bleeding comes. Opium is employed for its general quieting effect; gelatin and adrenalin chloride are given by the mouth and hypodermically for their effect in favoring clotting.

In hemorrhage in typhoid fever the nurse should withdraw all food and drink, elevate the foot of the bed, and place an ice poultice on the abdomen. Above all things, she should let the patient remain perfectly quiet and make no attempt to change the bloody sheets until so directed.

Hemorrhage from the nose is often successfully controlled by plugging each nostril with ham or bacon fat. Ice applied to the nose will usually be successful in mild cases. A variety of drugs, such as acetate of lead, gallic acid, tannic acid, Monsel's salt and solution, and many others are used for general and local astringent action.

There is a popular belief among the laity that salt is the *sine qua non* in the treatment of both hemorrhage and fits of all kinds, and on one occasion I saw a poor man with a lung hemorrhage held while some energetic "know-it-all" forced salt by the ounce into his choking throat before any one could reach his side and prevent the folly. It is not uncommon to see on the waistcoat of a chronic epileptic a badge bearing his name and address, and a request that no salt be put in the mouth in the event of a fit.

Hæmoptysis, or bleeding from the lungs, is commonly a result of consumption. The blood is coughed up and is usually frothy, unclotted, and bright red. A person suffering from such a hemorrhage should be placed at rest in order to reduce the blood-pressure by quieting the circulation. Ice should be applied to the chest and opium administered by mouth, rectum, or by injection (hypodermic). Rarely, a sudden large hemorrhage is the first indication of tuberculosis of the lungs. Bleeding from the stomach or hæmatemesis is distinguished from the before-mentioned condition by the fact that the blood is vomited up, is often clotted, and may be mixed with stomach contents. The treatment is in general the same. The ice, of course, should in this instance be applied over the epigastrium.

VACCINATION

Vaccination dates from the year 1798 when Jenner wrote his paper calling attention to immunity from smallpox enjoyed by those dairy-maids and farm hands who had been inoculated accidentally with cow-pox. Cow-pox is a disease appearing on the teats and udders of cows, and is readily inoculated either in other cows or in human beings.

It is still an open question whether smallpox and cow-

pox are different diseases or identical, certain experiments seeming to prove one view while others favor another.

Vaccination to-day is performed by scarifying the arm or leg with some sharp or pointed instrument, and then thoroughly rubbing in vaccine lymph obtained either from a vesicle on a cow or from a human vesicle. Care must be taken that the lymph be allowed to dry thoroughly before the clothing is replaced, as otherwise it may be all wiped away and the operation go for naught. In case of hurry a vaccination shield may be applied at once, the clothing replaced, and the shield removed when the vaccination wound is crusted over.

The point of selection for vaccination is on the arm at the insertion of the deltoid muscle. In girls it is often done on the leg either just below or just above the knee on the outer aspect, in order to avoid the appearance of the scar on the arm. The skin, after being cleansed carefully with soap and water, followed by alcohol or bichloride solution, is scraped either with the point of a needle or a scalpel in such a way as to cause outpouring of serum with little or no bleeding. The vaccine lymph, if glycerinized and fluid, is then either expelled from a glass tube upon the wound and rubbed in on the point of the needle or, if the lymph already be on an ivory point, this may be used for both scarifying and rubbing in. About the third day after the operation a small red papule appears at the site, and in two or three days more develops into a vesicle which soon assumes the characteristic umbilication of the true smallpox vesicle. After several days this vesicle dries, crusts over, and on the crust being shed there remains a red depressed area which eventually becomes the white pitted scar so well known to all.

When the vaccine vesicle is at its height the surrounding tissue is red, indurated, and itchy, and constitutional

symptoms, such as fever, loss of appetite, and general malaise, may be present. Complications may arise either from some added infection or because of poor physical condition of the one vaccinated. Vaccine roseola may appear generally over the body. Septicæmia or erysipelas may develop from the wound. Deep ulcers may succeed the shedding of the crust in weak children. Syphilis has been inoculated along with the lymph when such lymph has been taken from the human being. Tetanus occasionally has occurred. As a matter of fact, these accidents are sufficiently rare where proper aseptic precautions are carried out, and the foes of vaccination point always to these unusual occurrences and fail to mention the innumerable successful "takes" with their consequent immunities. Certainly, the mortality from vaccination in nowise approaches that which follows in the wake of the annual Fourth-of-July celebration.

Vaccination should at once be performed on exposure to smallpox, as the vaccinia has a shorter incubation stage and may head off, as it were, the smallpox.

Much has been said recently both for and against the use of vaccination shields, and several tetanus deaths have been referred to their use. If, however, these shields are kept clean, frequently changed if at all soiled with discharges, and if the same cleanliness of the wound beneath the shield is practised, as would be the case in any surgical wound of another nature, then the shield is a distinct advantage. A fatal case of tetanus occurred in a recently vaccinated boy in Philadelphia who removed his shield and threw it on the ground while he indulged in a game of baseball. At the end of the game he unconcernedly resumed the shield, probably then and there inoculating himself with tetanus bacilli, and died shortly after to become a monument to the ills of vaccination and shields, instead of serving as a warning against their abuse. Babies if well and healthy may be

vaccinated shortly after birth, though this is rarely nece sary. It is better, however, to have them vaccinated i the first few months of life.

INFLAMMATION

Inflammation is concerned in most diseases and man fests itself in different ways. For instance, the clea straw-colored fluid which is present in pleurisy is result of inflammation of the pleura, while on the othe hand the pus of an abscess and the membrane of dipl theria are also results of inflammation. These resul differ from each other because of the inflammation bein situated in different tissues and because of difference i the virulence and in the kind of poison. Diphtheria ba cilli attack mucous membranes and produce an adventi tious membrane, and thus have a specific inflammator action. The cardinal symptoms of inflammation are red ness, swelling, heat, and pain, and these symptoms ar accompanied by changes of function and structure i the parts affected. Formative changes are present also and fluid, lymph, fibrin, pus, or bloody fluid may result

The microscopic study of the live tissues, such as rab bits' ears or eyes, has taught us practically all we know of the nervous and vascular mechanism of inflammation When an irritant of some kind, usually of bacterial na ture, affects a part the primary change is a dilatation o the blood-vessels and an increase in rate of the curren of blood, to be soon followed by slowing of the current then complete stoppage in the capillaries. In the thir stage the white corpuscles are seen to cover the periphery of the vessels and to pass out through the vessel wall and wander through the adjoining affected tissue, at th same time fluid (blood plasma) exudes from the vessel also and causes the swelling and œdema in proportion t the amount present.

While the primary changes are in the blood-vessels, secondarily the cells of the surrounding tissues or organs are affected and undergo cloudy swelling, fatty degeneration, or necrosis, according to the variety and virulence of the inflammatory agent. Pus is made up of leucocytes, cellular tissues which have undergone degeneration, and blood plasma. Inflammation on mucous or skin surfaces, if violent, produces ulceration because of the casting off of diseased and degenerated surface cells. Gangrene is sometimes a result of inflammation, particularly where the circulation in the inflamed part has been impaired because of thrombosis of the veins.

Repair of inflammation is sometimes complete, at others incomplete, according to the extent of destruction of tissue accomplished.

In the simple form of inflammation which does not reach the stage of pus formation or ulceration, but which has merely passed through that of active hyperæmia, the part returns to a normal condition after the irritant is removed or exhausted. The swelling disappears when the exuded fluid is absorbed and the leucocytes return to the blood-current or die and are devoured by other leucocytes, or phagocytes as they are called when performing this function. When, however, the process has reached a point where destruction of tissue has taken place the repair is accomplished by the formation of granulations and, eventually, scar tissue. Granulations consist of young connective tissue cells and leucocytes, through which pass newly formed blood-vessels. This tissue replaces all highly specialized tissue that has been destroyed.

The granulation cells are derived from the fixed cells of the part affected and from the leucocytes. This same granulation process is concerned in the healing of wounds, with the exception of very clean-cut ones, when healing takes place by adhesion.

To sum up briefly, the pathological changes in inflam mation are primarily vascular under the influence o the vasomotor nervous mechanism, which is responsibl for the dilatation of the vessels and the determination o blood to an inflamed part. Secondarily, the outcrop o leucocytes and serum takes place, while at the same tim the neighboring fixed cells undergo cloudy swelling, fa degeneration, or necrosis, according to the nature of th irritant. The products of any given inflammation ar dependent on the tissue affected and to some extent th nature of the irritant.

Thus inflammation of the pleura results in a large out pouring of plasma with some fibrin and few leucocytes or if another irritant be active more leucocytes will wan der from the blood-vessels and pus be formed. Some times, and more rarely, such effusions are bloody, in which case there has probably been some malignant disease of the pleura with resulting hemorrhage. Inflammation of the lung or pneumonia is characterized by an outpouring of red and white blood-corpuscles and coagulable fibrin into the alveoli, which by coagulation produces the familiar consolidation of the lung. In diphtheria the mucous membrane of throat, tonsil, or larynx is inflamed and fibrin is exuded, which, together with necrosed cells, forms the so-called membrane. Ordinary mild inflammation of mucous membranes (so-called "catarrhal inflammation") results in a swelling or hyperæmia and a discharge of clear mucus or muco-pus, as is seen in the discharge from the nose in colds in the head.

Inflammation of the skin may result in ulceration or, as is oftener the case, is simply followed by desquamation, as in sunburn.

Of the resolution and repair process little more need be said. Scar or connective tissue replaces almost all tissues destroyed by inflammation. In the case of the skin, if none but the outer layers be destroyed, true skin

will be regenerated, but if the whole thickness be destroyed connective tissue will form and a scar result. For this reason it is most important to prevent children or adults from scratching chicken-pox or smallpox eruptions, as in so doing they may scar themselves badly, when if let alone nature would have regenerated the skin, providing the lowest layers be intact.

Rheumatic inflammation is usually situated in and around joints and produces a clear fluid effusion which is exuded from the synovial membrane of the joints, while a tubercular inflammation results in pus formation.

Treatment of inflammation consists in putting the affected part at rest, applying either heat or cold and remedies, such as lead-water and laudanum, ichthyol, or belladonna and mercury ointment, which, experience shows, either lessen pain or promote absorption of the exudate. As soon as pus forms in any medical condition, the case immediately passes into the domain of surgery.

The object of applying heat or cold without discrimination is to lessen the hyperæmia which is an early manifestation of inflammation, and in so doing lessen the amount of exudation and outcrop of leucocytes. This lessening of hyperæmia is brought about by causing a stimulation of the vasoconstrictor nerves, and may be effected by either very hot or very cold applications, and oftentimes the patient's own feelings in the matter may be consulted, particularly in cases of tonsillitis and quinsy.

In pericarditis usually cold applications (ice-bag) are made to the præcordium, while in pleurisy hot poultices or the hot-water bags give most relief from pain.

In erysipelatous inflammation of the skin and subcutaneous tissue ichthyol in 50 per cent. ointment kept continually on the affected area has a decided antiphlogistic action. Internally, quinine, iron, and mercuric

tient immediately returns to a normal condition, or in rare instances performs some act of violence or oddity, such as taking off the clothes. Lastly, the pulse is weak or even absent in fainting, while it may be unaffected in petit mal. For petit mal, regarded from the emergency standpoint, there is no treatment called for. In the case of grand mal the treatment should be directed towards the prevention of the fit, and the restraining of the patient from injuring himself and from being injured by over-zealous bystanders. The first desirable result can often be attained when these epileptic fits are preceded by some warning sensations in an extremity. If, for instance, the patient has some sensory or motor phenomena in an arm or leg, presaging a fit, by twisting firmly a towel or handkerchief around the part, oftentimes the attack may be averted. After the convulsion has become general the patient should be so placed that he cannot injure himself, and a wedge of wood or a roll of bandage should be forced between the teeth to prevent the tongue from being lacerated by the convulsive grinding of the jaws. Should the convulsion be of great length or one convulsion follow another, presenting a picture of the so-called *status epilepticus*, or epileptic state, and endangering life, anæsthetics, chloroform or ether, may be given and stimulants if the heart's action demand it. Throwing buckets of water on epileptics or stuffing their mouths with salt, two very common practices, are not only useless, but even cruel.

Hysterical fits are to be distinguished from epileptic by the fact that they are far more common in women than in men, and are usually preceded by emotional symptoms and accompanied by noises, cries, sobs, and shrieks while consciousness is present, though the loss of it be feigned. In the treatment of this condition sympathetic friends and relatives should be ordered away from the patient, a firm though not harsh tone taken, and

smelling salts or spirits of ammonia on cotton or gauze may be administered by inhalation. Bromides should be administered if the patient can be persuaded to swallow, and in extreme cases a little ether may be inhaled, more for moral than for anæsthetic effect.

Angina Pectoris is characterized by intense pain in the heart radiating down the left arm, by pallor, and a small pulse, all occurring usually in those past middle life. There is always danger of death in these attacks. The patient should sit or lie down, and nitrite of amyl should be administered by inhalation or nitroglycerin hypodermically in full doses. Chloroform by inhalation and morphia hypodermically may also be used. Those afflicted with angina pectoris should carry about with them little glass globes or "perles" containing from two to five drops of amyl nitrite, this substance sometimes cutting short an attack.

Convulsions in Children may be from epilepsy or from reflex causes, as, for instance, indigestion from overeating, or they may be the forerunner of some infectious disease, thus taking the place of the initial chill so common in adults. With this in mind, the temperature of the child should be taken in the axilla, either during the convulsion or immediately after.

Chill and Sunstroke.—Chills may be malarial in origin, in which case they will be immediately followed by elevation of temperature; they may denote the first step in an infectious disease,—a severe chill with pain in the chest following exposure should suggest pneumonia,—or they may simply follow exposure to cold and leave no after-effects. A patient suffering from a chill should be put to bed, covered with blankets, and surrounded by hot-water bottles, while some hot drink, such as coffee, lemonade, or whiskey, should be given. Quinine should not be administered unless there is well-

founded suspicion of malaria, and even then it can have no immediate effect on the chill.

The pathological effects of heat are manifest in two conditions: heat exhaustion, where the patient is weak, the skin leaky, extremities cold, and the temperature subnormal; and true sunstroke, where the skin becomes dry, the temperature greatly elevated, the patient unconscious, and the pulse weak. The preventive treatment consists in abstaining from alcohol of all kinds during hot weather, avoidance of large meals, careful attention to the condition of the bowels, and the immediate withdrawal from hard work or exposure to the sun on feeling faint or dizzy or on noticing that the skin is becoming dry and hot. The cessation of sweating when it should naturally be present is an early sign of approaching sunstroke. Heat exhaustion is treated by removal to a cool place, stimulation by aromatic spirits of ammonia, strychnia, and digitalis, and by the application of heat to the surface if the temperature markedly falls. Sunstroke should call for the most prompt and vigorous cold-water measures combined with friction. The patient should be placed in a tub of cold water, ice being applied to the head, and at least two persons should assist in rubbing the body and extremities. The water should be cooled with pieces of ice, and after fifteen minutes the patient should be removed and the rectal temperature taken. If the temperature be not sufficiently reduced the bath should be used again until the desired effect be produced. After removal from the bath the temperature should be frequently taken, as the tendency to relapse is very marked, and the patient should again be placed in the tub or rubbed with pieces of ice, should the fever again rise to a dangerous point. In suitable cases bleeding is of value.

Supposed Drowning.—No matter how hopeless a case of supposed drowning may appear to be, attempts at re-

suscitation should always be made and persisted in for at least fifteen minutes if the body has not been under the water for more than half an hour. Usually five minutes under water is almost sure to produce death, but the arbitrary time of one-half hour is mentioned in order to cover possible mistakes in computing the time, and also to allow for those rare and remarkable cases where recovery from drowning has occurred after submersion for that length of time.

The objects to be attained by treatment are removal of water from the stomach, which in most cases has been swallowed, and restoration of respiration, and thereby the introduction of the much-needed oxygen to the tissues.

Not a moment's time should be lost after the body is brought out of the water, and the treatment should be started on the boat, wharf, or beach, or wherever the first firm ground can be found.

If the patient is breathing the task is comparatively simple. The mouth and nose should be cleansed, all clothing loosened so that the breathing is rendered easy, and the body enveloped loosely in a blanket. After consciousness has returned hot whiskey and water should be given and the patient removed and placed in bed, and all precautions taken to prevent taking cold. When, however, the patient's breathing has ceased the problem is much more difficult and demands much skill in great haste. The mouth and nose should be cleansed and the finger inserted into the throat to see that no vomitus is obstructing the pharynx. The patient's clothes should be loosened about the throat, chest, and abdomen, or cut open with a knife, and the patient himself placed on a barrel or held upright by the heels while the abdomen is pressed in order to get rid of water which has been swallowed and which would impede the movement of the diaphragm in efforts at breathing. This should

occupy but two or three seconds, when the body should be placed flat on its back and artificial respiration begun. There are several methods of producing artificial respiration, the one which has seemed best for many reasons to the author is the Sylvester method. The patient is placed flat on his back, having a pad, if possible, under the shoulders, the tongue is drawn out or the head placed and held on one side to prevent the dropping back of the tongue; the arms are then seized firmly just below the elbows, and extended above the head as far as possible, where they are held for two seconds, and then slowly brought back to the base of the chest, which is compressed by pressing the arms against it for a space of two seconds. These movements are slowly repeated, while every effort is made to prevent vitiation of the air by the pressing in of the crowd which always collects on such occasions.

The rolling of bodies on barrels for indefinite periods, the blowing of breath directly into the patient's mouth, and many other like experiments are harmful, and the first one is almost certain to be fatal unless checked in time; therefore the most rapid and positive action and discipline are often necessary at these times. The giving of drugs hypodermically is scarcely worth considering, as when a patient is not breathing and is practically without circulation the drug would not be taken up until these important functions are restored. However, if a hypodermic injection of ether, aromatic spirit of ammonia, atropia, or strychnia can be administered without interrupting the artificial respiration, it should be given a trial. The after-treatment consists in placing the patient in bed and administering hot whiskey.

A method of producing artificial respiration known as the prone pressure method is described by Shafer of Edinburgh, and is in use in the Royal Life Saving Society. The principle of this proceeding is the reverse of the natural process of respiration, *i e.*, expiration is

accomplished by force while inspiration follows from elasticity of the ribs, and the resumption of the abdominal muscles and organs of their normal position.

The patient requiring resuscitation, either from partial drowning or from the effects of gas, anæsthetics, etc., is placed flat on the ground, lying prone with the face turned to one side or the other. The lower ribs are then pressed downward by the operator, who kneels on one side or astride the patient and applies pressure with both hands upon the lower ribs for three seconds. This pressure is remitted for two seconds, reapplied for three and so on at the rate of twelve times per minute.

According to Shafer, this method has proved much superior to other methods, and on theoretic grounds the claim seems justified. The forcible expiration is accomplished by pressing in the elastic lower ribs against the ground and by the same means forcing certain abdominal viscera into the chest cavity. Immediately on releasing the pressure the elastic ribs resume their normal position and the viscera seek their place and full respiration is brought about with the patient in a more favorable attitude for the draining of saliva and mucus, and vomitus, and for the tongue to fall forward.

Asphyxiation by Illuminating Gas, Sewer Gas, Mine Gas, etc., calls for exactly the same treatment that has been indicated in the treatment of cases of partial drowning, the object here also being to restore respiration and thereby oxygenation to the body.

Poison Cases.—These may be divided into two classes, suicide and accidental poisoning. In the first class, even if the patient be conscious, no trustworthy account can be obtained for obvious reasons, and a diagnosis must be arrived at by a study of the symptoms; in the second, however, the difficulty of diagnosis is generally done away with by coöperation of the patient.

Two general divisions of poisons may be made: first,

corrosive, or those whose effects are manifest through corrosive action; second, physiological, those whose effects are manifest through action on the various organs.

Of the corrosive poisons the ones most commonly taken are carbolic acid, corrosive sublimate, arsenic, ammonia, iodine, muriatic, nitric, and oxalic acids.

The common so-called physiologic poisons that are taken are opium and its derivatives, laudanum and morphine; chloral, strychnia, coal-tar products, aconite, belladonna, or atropia, digitalis, hydrocyanic acid or cyanide of potash, lead, poisonous mushrooms, and the venom of poisonous snakes, reptiles, and insects.

The diagnosis of a poison case is made by obtaining the history, by the appearance and odor of the vomitus, odor of the breath, inspection of the lips, tongue, and mouth (all of which may be burnt if the poison be corrosive), by examination of the pupils (contracted in opium and dilated in atropia poisoning), by counting the respiration and heart-beat, by excluding other possible causes, and finally, by searching the pockets for bottles, powders, or a farewell letter.

The treatment consists in removing any remaining poison from the stomach and the administration of chemical and physiological antidotes, and in the case of corrosive poison the giving of demulcent drinks, such as milk and eggs and sweet oil. Some poisons have neither physiologic or chemical antidotes. These must be treated symptomatically after unloading the stomach.

Vomiting may be produced by giving hot water and salt or mustard, ipecac in teaspoonful doses, or by getting the patient to tickle his throat repeatedly with his own finger or a feather. Under other conditions, where, for instance, a patient is unconscious or insane, a stomach tube must be passed or an emetic administered hypodermically, such as apomorphine $^1/_{10}$ to $^1/_5$ grain.

Often nature effects a cure by producing vomiting, especially where a large dose of poison has been taken.

Poisons.	Symptoms.	Treatment.
Carbolic acid.	Corrosive in action, producing sore lips, tongue, and throat.	Removal by an emetic or stomach-pump of any poison remaining.
Nitric acid.	Vomiting of bloody mucus.	Alkalies are chemically antidotal; magnesium sulphate and alcohol of peculiar value in carbolic acid poisoning.
Hydrochloric acid.	Passing of bloody stools; great gastro-intestinal pain.	.....
Acetic acid.	Collapse, convulsions, and death. In carbolic poisoning there is a strong odor about the breath, vomitus, and urine.	Magnesia, chalk, lime water, or plaster from wall in nitric and hydrochloric acid poisoning.
Ammonia.	Symptoms are much the same; a strongly corrosive poison.	Dilute acids, vinegar, lemon juice.
Corrosive sublimate, or bichloride of mercury.	Those of a corrosive poison.	No physiological antidote. Demulcents—eggs and milk, oil (castor or sweet), albumins form insoluble compounds with bichloride of mercury; hence the value of the white of egg particularly.
Arsenic: contained in Paris green, "rough on rats."	Arsenical poisoning produces symptoms difficult to distinguish from Asiatic cholera,—vomiting and purging of blood-streaked matter, great pain, collapse, and death.	Freshly prepared hydrated sesquioxide of iron is an excellent chemical antidote, and is kept in most drug stores ready for immediate use. Demulcents should also be given.
Iodine.	Those of an irritant poison; odor and color of vomitus sometimes characteristic.	Starch in solution in powder or wheat flour.

Opium and derivatives: morphine, laudanum, and paregoric.	Great drowsiness or profound sleep; contracted pupils; slow, deep respiration; finally deepening stupor, falling temperature, and death.	The stomach may be washed with potassium permanganate; patient must be kept awake by beating with towels or by electric battery; strong coffee, ammonia, and atropine should be given.
Strychnine and nux vomica.	General convulsions, cramps, and a picture exceedingly like that of tetanus.	Tannic acid; chloral and bromides; chloroform.
Phenacetin and coal-tar products: antipyrine, headache powders of all kinds.	Lightness in head; faintness; subnormal temperature; blue lips; cold extremities; weak pulse; perhaps convulsions and death.	Patient should be placed flat on the back; whiskey, ammonia, and strychnia given; hot-water bottles applied and the patient not permitted to exert himself in any way.
Aconite.	Tingling of mouth and tongue; small, compressible pulse; respirations shallow and irregular; sometimes vomiting and death.	Consists in giving physiological antidotes —digitalis, whiskey, strychnia; keeping the patient flat on the back, and, in the event of the temperature becoming subnormal, the use of hot-water bottles about the bed.
Belladonna and atropia, the active principle.	Dilatation of the pupils; unconsciousness with delirium; a rash like scarlet fever; rapid, full pulse and respiration; finally convulsions, stupor, and death.	Physiologic antidote is opium or morphine; tannic acid in large doses; hot applications, as mustard-plasters, to soles of feet and stomach.
Digitalis.	Severe vomiting; slow pulse followed by weak, rapid pulse, particularly on exertion; digitalis should be discontinued when the pulse goes below 50.	Tannic acid, followed by opium and whiskey.
Hydrocyanic acid or prussic acid.	Unconsciousness; convulsions; small pulse and irregular convulsive respirations; death in coma or convulsions.	Stimulation by whiskey; digitalis and strychnia; atropia and ammonia internally or by hypodermic.

Poisons.	Symptoms.	Treatment.
Lead: acute poisoning is rarely seen; subacute and chronic more common.	In the subacute form there is colic, constipation, anæmia, and a blue line on the gums, or paralysis of the nerves, particularly of the arm; the chronic form is shown by spinal diseases; lead may also affect the brain and cause a wild and often fatal mania.	Magnesium sulphate and dilute sulphuric acid, which forms an insoluble sulphate of lead; iodide of potash to absorb the lead already in the system; opium for the colic.
Toadstools.	Vomiting and pain in the abdomen; small pulse, collapse, convulsions, and death.	Magnesium salts; chloroform or ether inhaled to lessen convulsions; alcoholic stimulants.
Snake bite.	The area about the bite becomes dark and gangrenous; pulse is small and weak; vomiting, convulsions, delirium, and death.	Bite should be fully opened with knife, and sucked out if there be no abrasion on the lips or in the mouth of the operator. At the same time a tourniquet should be applied above the seat of injury and loosened for a second at intervals, in order that the poison which must enter the circulation should do so in small quantities at one time. Ammonia and alcohol should be freely given and the bite washed out with ammonia or burnt with a hot poker.
Ptomaine poisoning: from custards, ice-cream, meat, etc.	Vomiting; great depression; weak pulse; convulsions and death.	Atropia and morphia by hypodermic; whiskey, ammonia, and strychnia as stimulants.

For the sake of brevity, constant repetition of the necessity for the stomach-pump and emetics in nearly all cases of poisoning has been omitted in speaking of the treatment. For the same reason the taking of demulcents after corrosive poisonings must be taken for granted where unmentioned, as also the necessity of the supine position in all cases where the heart and respiratory centres are affected.

CHAPTER V

Personal Hygiene—Hygiene of Sick-Room—Care of Contagious Sick-Room—Disinfection.

PERSONAL HYGIENE

In the care of our own persons certain rules must be observed with more or less rigidity in order to enjoy good health. Nurses should have a certain time off duty during the day, in which to go outside and take a walk or exercise of some sort. Violent exertion is not necessary, but some gentle exercise should be taken daily by all. Bicycling and tennis in moderation afford plenty of exertion in a short time. Regularity of life undoubtedly conduces to good health and long life. Therefore our habits should be regular in regard to sleep, exercise, and eating. In private work it is often very difficult to obtain time from duty sufficient for exercise, recreation, or even sleep. However, the best possible use under the circumstances must be made of it. Six to eight hours' sleep is enough for most people and necessary for good condition. A daily bath should be taken, cold or hot, according to custom. Often when very tired, yet unable to sleep, a hot bath taken before retiring will produce the desired effect. Meals should be taken at regular hours, and dyspepsia avoided by thoroughly chewing the food, eating in moderation, and taking but moderate amounts of fluids at the meal. Overeating is considered by some to be a greater physical evil than hard drinking. Constipation may be avoided by regularity of habit, discretion in diet, exercise, and eating of fruit. Before resorting to medication for this complaint a physician should be consulted. Constipation often produces

a morbid mental state out of proportion to the gravity of the complaint. Stimulation of any sort should never be indulged in in order to keep going. Coffee or tea in moderation may be taken to help through a fatiguing night. Whiskey, brandy, or any alcoholic beverage must never be used for any such effect, as under such circumstances it would simply produce a sleepy condition and thus defeat the desired purpose. An alcoholic stimulant should never be taken with a view to warming the body if about to go out in cold weather. Finally, the more one abstains from stimulants of any kind the better.

It scarcely seems necessary to deliver a temperance lecture to women trained in the care of the sick and taught the principles of the preservation of health, and yet experience has proved its necessity. The constant taking of small drinks of whiskey because of being tired or cold, or for some other reason if neither of these exist, has often led to the formation of a drinking habit, consequent carelessness in work, slovenliness in appearance, and finally the usual disgraceful end. In regard to the taking of drugs—morphine, chloral, and cocaine—a few words seem quite sufficient. The habit once contracted is rarely if ever conquered. The result is always the same, and no degree of will-power seems to remain to assist in recovery. A nurse should never take doses of such drugs out of idle curiosity, and should never prescribe morphine, chloral, or cocaine for herself or give it to herself when prescribed by a physician. It stands to reason that, as to clothing, one should follow the seasons, wearing heavier clothing in winter and lighter in summer. Yet there are cranks in the matter of underwear as great in their particular line of crankiness as the food crank, and the Christian scientist crank, who maintain that the body is kept warm in winter by the wearing of mosquito-netting-like underwear. The greatest degree of comfort and health is obtained by underclothes of

such weight as to keep one warm when outdoors and yet not uncomfortably hot when indoors. Winter underclothes should, as a rule, contain some wool in their mixture. Recently, linen mesh underwear has become widely advertised and also widely worn. It has the advantage of not producing too great a degree of bodily warmth when indoors and a corresponding risk of taking cold when outdoors, and if proper weight be worn in winter, more comfort is obtained than with heavier garments. Shoes and stockings should always be changed if damp, in spite of apparent hardiness and ability to withstand colds. A cold is often the soil on which is grafted a more serious trouble, such as pneumonia, influenza, or rheumatism.

The organs of special sense should be given particular care, as much of the usefulness of a nurse is dependent on their function. The eyes should never be put to prolonged use under trying conditions. Reading in railroad trains and trolley cars is a severe strain on the eyes because of the constant changing of focus necessitated by the jolting and shaking of the car. The use of the eyes should be limited under these circumstances, particularly if there is a feeling of soreness and fatigue. Reading in bed is a strain to the eyes, as is also reading with either imperfect illumination or with the illumination coming from an improper direction. Light should come either from above or over one shoulder, but should never be directly in front of the reader. Any failure of vision or peculiarity of vision should at once suggest the propriety of an eye examination. Burning, redness of the conjunctivæ, collections of crusts at the margins or angles of the eyes, suggest some form of conjunctivitis. This may be treated, if mild, by the use of warm boracic acid solution or by simple bathing of the eyes with cold water. If this treatment is not soon successful a physician should be consulted, as it is pos-

sible that conjunctivitis is caused by some underlying condition of greater gravity. In the case of children, any symptom or action which seems to suggest possible eye trouble should at once be mentioned and the cause inquired into.

If a child frowns while reading or holds the book too close or squints, an investigation of the eye condition should at once be made, and in many instances a more serious after-effect is thus averted. In the care of the ears, cleanliness is the first requisite, and this may be accomplished by the ordinary use of the towel and washing; promiscuous syringing of the ear is to be condemned, as is also the use of hairpins and matches to remove wax. If wax becomes impacted it may be removed by syringing with warm water, but this should be done by practised hands and under the direction of a physician.

Earache may be relieved by the application of heat to the ear by means of a hot-water bag or bag of hot salt, but at the earliest possible occasion the ear should be examined and the cause of the earache determined. Ear specialists condemn the old-fashioned treatment of earache,—*i.e.*, the installation of a few drops of warm sweet oil and laudanum, though often much relief is obtained by the method.

Middle-ear disease shows itself in the common "running ear" of the laity, and should be treated consistently until it is well, as the condition is one which is a menace to health and even to life. Severe colds in the head when neglected are prone to lead to some suppurative ear trouble.

The nose and throat are closely related from a pathological point of view, as an inflammation affecting one usually involves the other also.

The constant taking of cold often results in a chronic catarrhal condition of the mucous membrane, particu-

larly of the nose, which may also secondarily affect the hearing.

People who take cold easily render themselves still more vulnerable by an unwise habit of clothing their bodies. They either dress altogether too heavily, wear chamois or flannel chest-protectors or abdominal binders, or in one way or another overheat some one section of the body.

As a matter of fact, the tendency to catch cold may be interpreted as a condition of chronic cold with acute exacerbations, and if this chronic cold be once shaken off, the tendency, so called, to colds will disappear.

The taking of cold may be avoided, first and foremost, by wearing underclothing that is neither too heavy nor too light, and by keeping the feet dry or by immediately changing the shoes and stockings when wet, by avoiding exposure to draughts, and by taking cold baths.

Care of the teeth is important, and twice daily the teeth should be brushed with some tooth-powder of simple composition, such as chalk and orris. Bad teeth render the proper chewing of food impossible, dyspepsia being the necessary consequence.

At least once annually a dentist should overhaul the teeth, as by this systematic care further trouble may be forestalled.

The skin may be best cared for by the free use of some simple soap, such as castile. The use of skin beautifiers of various sorts is a dangerous practice and is apt to be followed by disastrous consequences.

HYGIENE OF THE SICK-ROOM

The conditions of the sick-room in a private house should as nearly as possible be like those of a well-ordered hospital ward; that is, the room should be large and

airy, with a high ceiling, southern exposure, and capable of free ventilation. It should be secluded from the rest of the house in order to avoid noises and the odors of cooking. Where possible, it should be near a bathroom and water-closet and should have a connecting room where the nurse might read and rest, keep medicines and place food trays temporarily before their removal to the kitchen.

In addition, this room would afford a place for receiving directions from the physician, as often for one reason or another it is better for a patient not to overhear them. Here also friends may be intercepted, and oftentimes much needless excitement of a patient prevented. In our hospital wards where we deal with the poorer classes we are more or less compelled, as a routine measure, to admit visitors to see patients, no matter what the ailment, unless it be of a contagious nature. This is done for several reasons. In the first place, there really is no seclusion in a ward, and the patients may just as well see friends as converse with other patients. In the second place, neither the patient's friends nor the patients themselves would understand such exclusion and would eventually work themselves into such a state of excitement as would inevitably result in doing the patient much more damage than if the friends were allowed to enter. In special hospitals, where a cure of a case is next to impossible as long as sympathetic friends are permitted to gush over the poor sufferer, strict rules in regard to visitors are insisted upon.

In private nursing great discretion must be exercised in regard to visitors and the time they are permitted to stay. The physician's orders should be carried out to the letter in as tactful a manner as possible.

Remains of food should never be left about the patient's bed-side, as they draw flies and create a disgust for food.

Where it is possible to prepare a room in advance for a patient, the carpet should be removed and the floor thoroughly scrubbed, heavy curtains and pictures should also be taken out, and, in fact, everything which collects dust. The room should be thoroughly aired and strips of carpet placed where walking is necessary, in order to prevent noise.

In many cases all this is impossible, and the nurse will have to put up with the next best, which would mean careful dusting of the whole room before occupation.

Ventilation of the sick-room is best accomplished by an open fire in the room. A certain amount of natural ventilation always goes on, but this must be aided by opening the windows. The windows should be opened from the top and draughts on the patient should be avoided. Sometimes it is well to cover the patient up and then freshen the room by opening the windows wide for a short time. It is a well-known medical fact, but not at all well known to the laity, that people with any considerable amount of fever never catch cold.

Night air is popularly believed to be dangerous, but, so far from this being the case, it is actually purer than that of the day.

A nurse must also realize that the amount of ventilation necessary is proportionate to the number of people breathing in the room and the amount of combustion going on from lamps, candles, and gas-jets.

Plants give out small quantities of oxygen and absorb carbonic acid gas, hence are distinctly beneficial. Cut flowers decompose, and hence are injurious in a sick-room.

In contagious cases certain precautions are necessary to centralize the infection in one room or in one suite. Doors communicating with the rest of the house should only be opened when it is absolutely necessary, and these doors should be covered with sheets soaked in 1 : 60 car-

bolic acid solution, 1 : 500 bichloride of mercury, or weak formalin solution, and kept moist throughout the illness and isolation.

Linen dusters should be hung outside a window near the sick-room where they may be put on by the physician before entering and returned on leaving the infected room.

The nurse herself should change all her clothing, take a thorough bath, and wash her hair before going out among unexposed people. Excreta, sputum, and other possible sources of contagion should be disinfected immediately and disposed of.

Under no circumstances, no matter what precautions are taken, should a nurse in charge of a contagious case go among children unless the full consent of parents or guardians be obtained.

Before permitting a patient convalescent from a contagious disease to mingle with non-immunes a warm bath must be given (bichloride of mercury 1 : 10,000), and particular attention must be given to the hair.

DISINFECTION

This is the destruction of the infective power of pathogenic micro-organisms, and one of the most important sides of prophylactic hygiene. Disinfection may be conducted on a large scale, as, for instance, in the cleansing of large buildings, holds of ships, or masses of merchandise or clothing, or on a smaller scale when it merely relates to the prophylaxis in one individual case or a small group of cases. The latter, being of more interest to the nurse, will be particularly dealt with in this chapter.

A disinfectant is an agent capable of destroying the life of bacteria.

A germicide is an agent capable of killing micro-

organisms and their spores. The terms disinfectant and germicide are by definition synonymous.

An antiseptic is an agent that prevents the growth and virulence of bacteria, without, however, destroying them.

Asepsis, or sterilization, signifies an absence of all bacteria, whether disease-producing or not.

Deodorants are agents that destroy odors. Many disinfectants are deodorants, but deodorants are not necessarily disinfectants.

Expressed in the simplest terms, the disinfectants or germicides have the greatest strength, the antiseptics lesser strength, while the deodorants have the peculiar property from which they derive their name, and may be in their other relation either germicides or antiseptics.

Before bacteriology existed disinfection was attempted, even though the *rationale* of its effects was not even dimly understood. Now, with our growing knowledge of the habits and mode of life of many hundreds of bacteria, the methods of attacking their harmfulness are becoming more and more perfected.

Infectious diseases may be roughly divided into those that are air-borne and those that are carried by other media.

To the first class belong—

Measles,	Typhus fever,
Chicken-pox,	Whooping-cough,
Smallpox,	Erysipelas,
Influenza,	Mumps,
Scarlet fever,	Rötheln,
Diphtheria,	Tuberculosis.

To the second class belong those conveyed by means of water, food, insects, and by inoculation:

By *water*	Typhoid fever, Cholera, Dysentery.	By *insects*	Filariasis, Malaria, Yellow fever Typhoid.
By *food*, such as oysters, milk, fruit, etc.	Tuberculosis, Typhoid fever, Cholera, Summer diarrhœa of children.	By *inoculation*, either through wounds or by bites of animals.	Leprosy, Syphilis, Vaccina, Ophthalmia, Gonorrhœa, Tetanus, Anthrax, Puerperal fever, Tuberculosis, Hydrophobia, Pyæmia, Septicæmia.

An attack of any disease of the first class, with a few exceptions, confers immunity from subsequent attacks of that disease.

The rules in regard to the time of isolation of cases are to some extent laid down by the municipal boards of health. However, they cannot, of course, regulate the work of isolation that should be carried on within an infected house to prevent the spread to individuals.

Cases of measles should be kept away from non-immunes for at least two weeks from the date of the disappearance of the rash, provided that all desquamation has ceased. Scarlet fever cases should be isolated until all desquamation has ceased. In the majority of cases this will mean an isolation of from three to four weeks.

Smallpox and chicken-pox should be isolated until all the scabs of the eruption have been shed.

Diphtheria requires isolation until the cultures show the absence of the Klebs-Loeffler bacillus.

Children with whooping-cough should be isolated until the characteristic whoops have disappeared. This period will probably be some six weeks.

Disinfection in cases of diseases of the first class, or air-borne infections, is undertaken with a view to prevent the spread of the infection outside of the sick-room, as well as to free the room from danger to others after the attack is ended. Unfortunately, we are unable to disinfect the air, or, as a prominent hygienist once put it, "We can 't kill bacteria on the wing," and therefore we must shut off the circulation of air from the sick-room to the adjoining portions of the house, in order to prevent the contaminated air from infecting the whole house.

The best way of obtaining more or less pure air in the sick-room is to provide free ventilation and as much sunlight as possible. Bacteria, as well as spores, are killed by exposure to the sun. Heat, either dry or moist, is very valuable as a disinfectant. A temperature of 150° C. maintained for one hour is sufficient to kill all bacteria and spores. It is not possible, however, to subject many fabrics to such a heat, as they would in all probability be scorched. A temperature of 110° C., when maintained for two hours, is effective in destroying most bacteria. The required heating may be accomplished in a specially made sterilizer or in the ordinary cooking oven. The temperature in the latter case must often be merely guessed at, and may be judged by stopping the heating just short of the point where singeing takes place. The objection to dry heat is that it does not penetrate fabrics as well as moist heat, particularly if the latter be under pressure.

Steam is perhaps the most generally useful of all the disinfectants. It is very penetrating and kills both bacteria and spores after short exposures. Its disadvantages are that it causes shrinkage in some fabrics and

makes certain colors run. Sterilization by steam a small scale may be best accomplished by the use ne or other of the numerous sterilizers in the market lay. Some of these provide steam under pressure, superheated steam, thus rendering the sterilization st complete. On a larger scale, steam disinfection y be accomplished in a steam chamber in which ob-ts, such as mattresses, bedding, and blankets, are ng. The room is then filled with steam and allowed stay so for a period of two hours, which is usually uite sufficient to produce sterilization. Boiling of in-ected linen, sheets, night-gowns, and towels is a most atisfactory method. The main objection, however, is hat albuminous stains, such as those of blood or pus, become fixed in the fabric. This also holds good of the dry-heat method.

Of the gaseous disinfectants the most efficacious and commonly used are formaldehyde and sulphur.

The first is a colorless, irritant gas produced by heating a 40 per cent. solution of formaldehyde and water, known commonly as formalin. Formaldehyde may also be liberated by heating tablets of paraform, which is a solid polymeric form of formaldehyde. The advantages of formaldehyde as a disinfectant are that it practically does no harm whatever to the ordinary objects in a room; clothing, carpets, silks, pictures, or mirrors are not attacked.

Formaldehyde gas may be generated by one of several varieties of apparatus, one kind being designed to liberate the gas from its watery solution, another to evolve it from its polymeric solid form. Of the first variety the Lentz apparatus is a very fair example. It consists of a copper vessel held in position over a lamp. This vessel holds about four pints of formalin, from which formaldehyde gas can be very rapidly generated. The generator is best placed outside the room to be disin-

fected and the gas conducted by means of a rubber tube passing through the key-hole. When the fluid in the copper vessel is lowered by evaporation beneath a given point gas will escape from a stopcock, and thus give warning either to put out the lamp or renew the formalin. In this method at least ten ounces of formalin should be used for every one thousand cubic feet to be disinfected, and the gas allowed to stay in the room for from six to twelve hours. All cracks should be sealed with rags, and fireplaces and registers blocked in the best way possible. In using the Schering lamp the gas is generated from either powder or pastiles of paraform, a polymeric form of formaldehyde. The lamp should be so regulated as to heat the paraform without causing it to take fire, in which latter event no formaldehyde will be liberated and consequently no disinfection take place. This lamp is best suited for the disinfection of rather small areas. The advantages are the cheapness of the lamp and the readiness with which it can be handled. Two ounces of the paraform should be used in every one thousand cubic feet to be disinfected and a longer exposure given than in the other methods. Disinfection by the burning of sulphur with the production of sulphur dioxide is a method of great value when cheapness is an advantage and where the areas to be cleansed do not contain perishable goods. Sulphur dioxide has the disadvantage of bleaching many coloring matters and corroding most metals. It also weakens cotton and linen fabrics.

To obtain results in burning sulphur as a disinfectant it is necessary to supply a certain amount of moisture, as the dry gas is ineffectual in destroying bacteria possessed of much resisting power.

The best way to conduct the disinfection of a room by sulphur is to place the sulphur in powdered form in an iron pot, which in turn is placed in a large vessel

containing water. Thus when the sulphur is ignited the water is evaporated by the heat and supplies the moisture necessary to successful disinfection. Five pounds of sulphur should be used for every thousand cubic feet. It is essential that all cracks and crevices should be filled and that the sulphur vapor be allowed to remain in the infected room for about twenty-four hours. Brass on bedsteads or gas fixtures should be smeared with vaseline, and perishable objects should be removed from the room and disinfected by other means. It is important where disinfecting by gaseous means not to move books, furniture, and other things from the positions they have occupied during the infectious illness. The object of this is to keep exposed those surfaces which have been exposed to the infection and to prevent the covering up of bacteria and their removal from the disinfecting gas.

Of chemical solutions the first and foremost in importance is the bichloride of mercury ($HgCl_2$). This chemical in proper dilutions has almost universal applicability as a disinfectant. In strength of 1 : 500 to 1 : 1000 bichloride of mercury solutions are strongly germicidal. Its disadvantages are that it corrodes metals and will not disinfect albuminous matter, and is therefore of no value as a germicide in the case of fæces, sputum, or pus. Bichloride of mercury is not very soluble in cold water, and it is therefore better to keep on hand alcoholic solutions of concentrated strength from which the watery solution may at once be made. It is well also to have some coloring matter mixed with the solution in order that it may readily be distinguished from water.

Carbolic acid is used in from 3 to 5 per cent. solutions, and is very valuable as a disinfectant. It has the advantage over bichloride of mercury that it may be used to disinfect albuminous matter and clothes

stained with albuminous stains. It is very commonly used as a disinfectant of sputum and fæces.

Formalin is valuable also as a disinfectant and may be used in a 4 per cent. solution. It corrodes iron and steel, but does not affect other metals. It may be used in the disinfection of albuminous material and is also deodorant.

Chlorinated lime is used principally for deodorizing and disinfecting fæces, for which it is very valuable. It is best used in the powdered form and should be thoroughly mixed with the fæces in almost equal proportion of bulk.

The Disinfection of the Sick-Room.—In disinfecting a sick-room in a private house the best method is that by formaldehyde gas. The patient, having been given a bath and supplied with clean clothes, is removed to a room free from infection. The cracks and crevices in the sick-room as well as the ventilators, registers, and open fireplaces are all most carefully sealed, and the formaldehyde gas introduced by one or other variety of lamps previously mentioned. The clothing and sheets should be spread out on lines so that all the surfaces may be exposed to the gas, and the room should not be reopened for twenty-four hours. Furniture, hangings, and books should be left in position. In securing ventilation of the room when the disinfecting process is at an end some ingenuity may be required, as it is impossible to either breathe or keep the eyes open in an atmosphere surcharged with irritant formaldehyde vapor.

If the mattresses and heavy bedding have become soiled, such disinfection as just described will not be sufficient, and nothing but steam under pressure in an apparatus of special kind will thoroughly do the work. In such case the infected materials may be enveloped

in a sheet wet with 1 : 1000 bichloride solution and sent to the nearest public disinfecting plant.

Sputum should be received in china or glazed earthenware cups, which should contain a small quantity of 5 per cent. carbolic acid solution. Pasteboard cups, which may be burned, are still more useful.

Fæces to be disinfected may be either intimately mixed with chlorinated lime, carbolic acid solution (5 per cent.), or 4 per cent. formalin solution, and should be left standing for one hour. It is important to see that flies are not permitted to settle on excreta, as in so doing they become dangerous sources of infection.

Urine may be disinfected by either carbolic acid, bichloride, or formalin, and account must be taken of the dilution of the disinfecting solution by the water of the urine, and the proportion made correspondingly greater.

Bed linen or body linen which is to be carried from the sick-room to be disinfected and washed should be entirely enveloped in a sheet saturated with 1 : 1000 bichloride of mercury solution and dropped without being previously opened either into a tub containing 1 : 2000 bichloride solution or into a boiler placed on a range in which the contents may be thoroughly boiled for one hour.

of fever, particularly in children, and may be due to inability of the stomach to digest food that is present, owing to the disturbance in the stomach temperature and the deficiency or altered quality of the gastric juice. Vomiting during the course of the fever is a sign that the diet needs adjusting, provided that all organic causes of vomiting have been eliminated.

The bowels are usually constipated, though sometimes diarrhœa is present at an early stage. The diarrhœa of typhoid fever is due to the ulcerated condition of the intestines, and not to the mere fever. The color of the movements is generally light yellow, but this also is not to be ascribed to the fever, but to the milk or liquid diet usually given while fever is present.

Circulatory System.—In fever the heart action, as shown by the pulse, is accelerated and strong in the early stages, rapid and weak later on. It is usually of large volume but of low tension. The low tension and weakness are often due to febrile degeneration of the heart muscle. When the heart becomes irregular in action it is an indication of grave weakness of the heart muscle, and possibly also of the nervous mechanism of the heart. A pulse-rate of 140 and over is a grave symptom except in scarlet fever, where a rapid pulse is the rule. During convalescence from fever the pulse may be slower than normal and liable to greatly increase in rate on exertion.

Respiratory System.—Rate of respiration may be increased in fever with but little or no perceptible change in depth. In grave cases of fever respiration may be profoundly affected, in common with the circulatory and nervous centre and become shallow, jerky, irregular, or of Cheyne-Stokes type. Here again the cause of the change cannot be wholly ascribed to the elevation of temperature, but rather to a combination of the fever, the effects of infection, and altered metabolism.

Nervous System.—Manifestations of disorder of the nervous system in all degrees are common in febrile diseases.

Headache is commonly present at the onset of fever, particularly in that of typhoid. The headache may be frontal (most common), all over the head, or occipital (in meningitis). It may vary very much in intensity from a dull, heavy feeling to an unbearable throbbing pain. Also, headache which has accompanied the onset of fever may lessen and disappear though the fever continue.

Chills or chilly sensations usually usher in a rise of temperature in adults, while in children they may be replaced by convulsions.

Chills denote an upsetting of the heat-centres, and it is to be noted that during a severe chill, as for instance in malaria, the temperature may be as high as 104° or 105° F., thus showing a loss of perception on the part of heat-centres.

As has already been stated, convulsions may replace the initial chill of an infectious fever in children. This convulsion also may be regarded to some extent as an effect of fever on the cerebral and spinal systems.

Delirium is to be expected in very high or very prolonged fever, and particularly where the patient has recently been taking alcohol in any considerable quantity. Delirium may be light, such as is seen in mild typhoid or pneumonia cases, and may be present only at night when the temperature is at its greatest height. In other instances delirium may be wild and noisy, the patient screaming and shouting threats or cries for help until exhausted. During this period there is grave danger of the patient jumping from a window or dashing out of a house, at the same time opposing violence to anyone attempting to restrain him.

Again delirium may be of the low muttering type in

which there is no excitement, and the patient lies quietly talking in low unintelligible tones and picking at the bed-clothes. The symptoms of twitching or jumping of the tendons, the so-called subsultus tendinum, is apt to accompany the above-mentioned symptoms.

Mental hebetude, or stupor, may be present, or a greater degree of the same condition, profound coma, from which the patient can with difficulty be aroused even for a short time.

The so-called "coma vigil" of typhoid fever is a condition in which the patient lies in a comatose state, with eyes open, but not recognizing objects or persons.

Mania or *melancholia* may develop in the course of fevers, particularly in that of typhoid, or may follow them.

Delirium tremens must be looked upon rather as an effect of alcohol than of fever, as it is as likely to occur in a surgical case in which fever is absent as in a fever condition. Coarse and fine tremors are commonly seen also.

In nearly all fevers of considerable duration, if neither delirium nor coma, the graver nervous symptoms, be present, there are minor mental changes, such as dulness, listlessness, and lack of power of concentration. Lightness of the head and vertigo are common when exertion, such as an effort to sit up, be made.

Urinary System.—The urine in fever is scant, high-colored, heavy, and perhaps cloudy. During convalescence it is the reverse, being large in amount, pale, and of low specific gravity.

Menstruation is commonly suspended during fevers, but it may be present and proceed normally.

Special senses may be, and usually are, affected in a greater or less extent. There may be flashing before the eyes, sensitiveness to light, hallucinations of vision, and conjunctivitis. Senses of taste and of smell may

be perverted or lost. Ringing and fulness are often present in the ears; actual deafness usually having a direct infectious inflammatory origin.

Nutritional Changes.—The body loses weight rapidly in sustained fevers, and this may amount to positive emaciation, which is often seen in children. In adults bed-sores are apt to be present, due in part to the loss of flesh consequent upon the fever and also to a loss of nutrition of the skin and underlying tissue. Bed-sores are not so common in children, possibly because the pressure on the exposed parts is less than in adults owing to the lighter weight of the children.

TREATMENT OF FEVER.—In general, we have two methods of combating the elevations of temperature of febrile diseases,—first, by the use of antipyretic or fever-reducing drugs, and, second, by the application of cold water.

The antipyretic drugs are positively objectionable because of their depressing effect on the heart and nervous centres, and negatively objectionable because they do not produce many of the beneficial effects which are noted where cold water is the temperature-reducing agent. Opinion is now unanimous in condemning the use of antipyretic drugs as a routine treatment of any fever, the profession having recognized long ago that the mere reduction of the temperature of a fever case did little or no good, while the use of the drugs has often been attended by very positive harm and in some instances by death.

The drugs most commonly used to reduce fever are phenacetine, antipyrin, and acetanilid, the principal coal-tar products (taken internally), and guaiacol painted on the chest or abdomen. Quinine is more used for its specific action in reducing temperature by killing malaria germs, though it also has some antipyretic action. The fall of temperature following the

use of the coal-tar drugs has been accompanied by such alarming collapses and such little benefit that at present they are but rarely used, and sole reliance in effecting reduction of temperature is placed on cold water applied by sponging, cold pack, or bathing.

The cold-bath treatment of typhoid fever was first systematized by Brand, of Germany. Its good effects in general are to be noted in the quieting of the nervous system, stimulation of the pulse, and lessening of the mortality. Brand claimed that if the cold-bath treatment were instituted before the fifth day of the disease every case would recover. In support of this statement he furnished statistics of cases so treated in which there were but twelve deaths in twelve hundred and twenty-three cases, a mortality of 1 per cent.

Technique of Bath Treatment.—The directions laid down by Brand are that a patient should be placed in a tub of water at a temperature of 64 to 68° F. for fifteen minutes every third hour if the temperature should be as high as 101.3° F. in the axilla or 102° F. in the rectum.

To lessen the sensations of chilliness during the bath the abdomen, chest, back, and extremities should be vigorously rubbed with the hands, and the shortness of breath and shocked feeling may be minimized by pouring on the head at intervals water that is colder than the contents of the tub. At the end of fifteen minutes the patient is removed from the tub, but lightly dried, covered also lightly, and given a glass of port or sherry or a half-ounce of whiskey.

During the whole proceeding the patient should be spared any exertion whatever.

In conducting this treatment in private houses it is necessary either to have a bath-tub on wheels which can be filled and emptied on the same floor on which the patient is confined, or else a stretcher on wheels on which

the patient could be placed and without exertion on his part lowered into the tub.

In hospital work both of the before-mentioned methods are in use. The bath water must always be changed for each bath and each person, and it is an open question whether it is more economical of time and strength to wheel the patient to the bath or the bath to the patient.

The method of Brand is subject to many minor variations depending on personal opinions. Many physicians give a bath of 75° F.; others order bathing only for higher temperatures, such as 102° F. by mouth or perhaps 102.4° F. by axilla. Others, again, believe that slight exertion on the patient's part in getting into the tub is beneficial and should be encouraged. All are agreed on the importance of the vigorous rubbing during the time the patient is in the water. The nurse should request the physician in all cases for such details of the bath treatment, the temperature of the bath, the temperature of the patient at which to bathe, and the length of time and frequency of the bath.

Contraindications to "tubbing" in typhoid fever are few. Hemorrhage and perforation of the bowels always contraindicate them, and sometimes extreme weakness or prolonged chilliness suggests the advisability of trying other refrigerant methods.

Sponging.—Is commonly used in fever conditions where the patient is suffering from the high temperature or where there is a prolonged fever and the cold tub is not indicated.

A blanket should be placed beneath the naked patient and one over him also. The nurse then sponges the extremities and body with a soft cloth or sponge wrung out in a basin of water containing ice. To prevent undue exposure one limb or one part of the body is treated at a time, while the rest remains covered up. Usually the face is sponged first, to be followed by one arm, then

the other, the trunk, and finally the legs. A cold compress is placed on the head and is changed as required during the fifteen or twenty minutes which is usually consumed in the sponge. Cold compresses should also be applied to the abdomen. The object of the sponge is simply to moisten the surface of the body and produce at the same time friction which aids the general circulation. The body should not be drenched with water. Alcohol may be used in the water, or a certain temperature of the water may be directed by the physician. In children, especially at first, it is better to use water of the temperature at which it flows from the spigot.

The sponge-bath is not so effective as the tub, but it benefits by reducing the temperature, cleansing and stimulating the skin, improving the circulation, and easing the patient of aches and pains and disagreeable sensations of heat. It has a similar but less marked action than the tub treatment. In bathing and sponging it is important to remember that the temperature of the water naturally rises, and reference to the bath thermometer should be frequent. This is particularly true of the tub treatment, where the whole body of the fevered patient is immersed in the water, with the natural consequence of elevating the temperature of the latter. Ice in small pieces should be added as necessity arises.

The cold pack is sometimes applied when for some reasons the other two methods are not desirable. The patient is placed between blankets and wrapped in a sheet which has been soaked in water and then wrung out. A cold compress or ice-bag is applied to the head and changed as often as necessary. This pack should last for from ten to twenty minutes, and the temperature of the water is varied to meet the conditions by the physician. After the pack the body should be very lightly dried and covered lightly also.

There are other modifications of these methods just described which seem scarcely necessary to mention, as any of these means properly applied will meet as far as is possible any febrile emergency, with the possible exception of sunstroke. Here the conditions are somewhat different from most febrile processes, owing to the great height of the temperature and the consequent necessity for immediate steps to lower it to prevent death from that cause alone.

The ice rub is commonly used in sunstroke, and may be thus described: The patient is stripped, placed on a rubber blanket, an ice-cap is applied, and the chest, abdomen, extremities, and back vigorously rubbed with pieces of ice. This proceeding should continue until the temperature has reached a point determined by the physician. Sunstroke cases are also treated in a tub after the manner of the tub-bath already described, with the difference of having the water made very cold by means of cakes of ice.

The results of cold-water treatment are a lessening of the uncomfortable sensations of heat, and of the headache and back and leg pains, the quieting of delirium and excitement, the strengthening of pulse and circulation and respiration, a cleaner and moister tongue, less abdominal distention, and fewer complications.

Treatment of symptoms may best be considered if the question be discussed system by system.

The coated tongue so often seen at the onset of fever is treated by the administration of calomel, either in one large dose of from three to five grains or in divided doses until a free movement of the bowels takes place.

To prevent the collection of sordes on the gums they should be gently wiped with a piece of lint soaked in boric acid or with a tooth-brush and any good tooth-powder. A mouth-wash of dilute hydrogen peroxide or tincture of myrrh may also be used. When the tongue

and lips are dry and cracked—a condition less frequently seen since the general introduction of the cold-bath treatment—cold cream or vaseline may be applied to the lips and glycerin and lime-juice in equal parts to the tongue. Sweet oil or liquid vaseline may also be applied to the tongue.

The Skin.—The care of the skin is important, particularly in relation to the prevention of bed-sores. If the range of fever does not call for tubs or sponges, the patient should be sponged at least once daily for purposes of cleanliness. In addition, the back should be sponged with alcohol diluted one-half with water, dried, and dusted with zinc-oxide powder if the fever be one of long duration or the patient's back show signs of stagnant circulation or of inflammation.

Treatment of Digestive Symptoms.—Nausea and vomiting are best treated by withdrawal of all diet while the nausea lasts, administration of cracked ice, or, that not succeeding, calomel may be given in small divided doses. If pain in the stomach accompany the vomiting a hot-water bottle or a mustard-plaster may be applied. The diarrhœa seldom calls for treatment, as regulation of the diet and rest in bed generally check it. Constipation is more common, and a simple enema of soap and water should be given every other day when this condition exists. If this is not effectual an enema of turpentine, castor oil, and magnesium sulphate, glycerin, suppositories, or laxatives by mouth may be tried, such as castor oil, salts, cascara sagrada, or the well-known and useful aloin, strychnia, and belladonna pill.

Respiratory System.—Irregular, shallow, rapid breathing, or breathing of Cheyne-Stokes type, is always of serious portent in all fevers, and calls for the administration of respiratory stimulants, such as strychnia and atropia, and the persistence in the cold-bath treatment in its every detail.

Nervous System.—The wonderful effects of the cold-bath treatment are more apparent in connection with the nervous system than with any of the other systems. For example, in typhoid fever a case may progress through the whole illness most favorably with no medicinal treatment whatever, the nervous symptoms, so primarily identified with typhoid, being counteracted solely by cold-water methods. However, in severe cases or in those where the tubbing or sponging has been begun late in the disease some of these symptoms may call for other treatment.

During chills or chilly sensations the patient should be covered up well, and in extreme cases hot-water bottles applied. After the chill, if the temperature be high and the patient feel warm, there is no longer need for heavy covering nor any particular danger of taking cold. During free sweating following fever or taking place with the decline of fever, particularly if the temperature become subnormal, care should be taken not to expose the patient to any draughts and to change the night-linen as often as it becomes wet. Free sweating while the course of the fever is maintained is by some regarded as an effort of nature to reduce temperature by extracting heat from the body.

The headache of fever may be relieved by an ice-cap or by cold compresses, sometimes by hot, or, these failing, by phenacetine; antipyrin or guarana may be administered. A hot mustard foot-bath is of benefit in children. Very often, as has been elsewhere said, the headache is present only in the early stages of a fever, and disappears spontaneously as the fever progresses.

Convulsions are best treated by the hot bath, with perhaps a small handful of mustard thrown in the water. Precaution should be taken to see that the patient does not bite his tongue or roll off the bed and injure himself. In the event of prolonged convulsions chloroform or

ether may be given, but not pushed beyond the first stage, and chloral and bromides may be administered by rectum.

Delirium seldom calls for any treatment except the hydropathic. It is well always to see that a sheet is firmly tucked in and pinned safely when a patient is delirious. This may be done without exerting any harmful pressure on the thorax or abdomen, and very often it proves quite sufficient to hold an ordinary delirious patient. Sometimes, however, delirium becomes violent, and the patient makes tremendous efforts to get out of bed and commit some act of violence or of self-destruction, and can only be restrained by the use of hand- and foot-cuffs and straps. For these patients it is often very much better to use mechanical restraint at once, as physical contention excites them more and more, The delirious typhoid patient should never be left alone.

Chloral, bromides, or morphine may be used if the delirium or restlessness be of sufficient degree to unfavorably affect the case. For the comatose conditions or the coma vigil of typhoid, nerve stimulants, such as strychnia and musk, are of use, and the cold tubbing should be continued.

Mania and melancholia may develop during or immediately after an attack of fever, but are usually followed by recovery. Delirium tremens rarely develops during typhoid, but is common in pneumonia and has a most unfavorable bearing on prognosis.

Urinary System.—The kidneys and bladder are both prone to involvement in the course of a long fever. It is important for the nurse to see that the patient drinks plenty of water in small quantities at a time and also to see that the bladder is emptied at regular intervals; at least every eight hours unless otherwise directed. This is most important in cases where there is delirium or stu-

por. Soft rubber or glass catheters should be used and every aseptic precaution taken to prevent possible infection of the bladder. Changes in the appearance and quantity of the urine should be noted and reported to the physician. Pain in the region of the kidneys may be relieved by hot-water bottle or hot compresses.

Suppression of urine is a grave sign and calls for active treatment. Free sweating should be induced by means of hot-air bath, hot-water bath, or hot pack or the use of pilocarpine hypodermically. Diuretics should at the same time be administered. Caffein, potassium citrate or acetate, and diuretin and a free purgative should be administered in order to drain through the bowels the poisonous matter retained in the system.

The urine of typhoid fever cases should be disinfected, as it contains typhoid bacilli during the illness, in convalescence, and sometimes for long periods following recovery.

Nutritional changes are chiefly evident through wasting of the tissues—emaciation. The milk diet usually given to adults consists of forty-eight ounces of milk in twenty-four hours given in divided doses either every three or four hours. This quantity has been shown to be as much as the average fever case is capable of taking care of, and yet often it is not sufficient to keep up the nutrition of the body. Under some circumstances it seems necessary to add something else to the milk diet both to relieve its monotony and also to give additional nutriment. Chicken-broth, strained soup, or junket may be given if ordered by the physician. Children particularly are apt to become emaciated in the course of a fever, and require some addition to the milk diet, such as oatmeal, gruel, cocoa, dry toast, or finely chopped meat.

Sometimes in typhoid fever cases the fever persists after the specific course of the disease has ceased, and

the patient complains greatly of unsatisfied hunger. Under such circumstances the fever often disappears and the patient makes a rapid recovery if the diet be extended so as to include soft toast, junket, or chopped beef. This addition to the diet, however, must be considered experimental, and should be at once withdrawn on the appearance of signs of digestive disturbance or elevation of temperature.

The hair very commonly comes out freely after a prolonged fever, and should the loss be very great it is better, either in male or female, to crop the head closely. The hair nearly always renews itself, and there is no absolute necessity for the cutting.

Bed-sores are the result of pressure on prominent areas of the body which break down because of nutritional defects. To forestall their formation the back should be kept scrupulously clean, the sheets free from wrinkles, and circulation in the threatened areas should be stimulated by daily rubbing with alcohol, also the patient should be placed in such position as to relieve all pressure from these areas. After a bed-sore has formed the patient should be placed so as not to press on the sore, or in the event of there being several bed-sores and such a position being impossible, rubber rings may be arranged to accomplish the same purpose. The sore or sores should be kept surgically clean, sloughs removed, and stimulating applications, such as washes of silver nitrate solution or copper sulphate, applied. They should then be dressed with gauze, and later on when granulation begins, green "protective" should be placed on the ulcer and the gauze over that. Poultices are useful to separate sloughs.

Organs of Special Sense.—The eyes should be protected from direct or bright light and all reading should be interdicted. If the eyes be painful and conjunctivitis be present, cold or hot compresses may be used, or the

eyes may be washed with warm saturated solution of boracic acid.

Earache calls for hot applications. Should there be discharge from the ear it should be washed out with hydrogen peroxide or hot boracic solution as often as ordered. Any appearance of inflammation or tenderness back of the ear should be at once reported to the physician, as it might indicate grave mastoiditis.

Disturbing noises both without and within the house should be done away with as much as possible, and conversation in and about the sick-room should be conducted in low tones, and nothing that the patient should not hear must be mentioned, as, even though apparently unconscious, patients may overhear in a wonderfully acute way some remark that may unfavorably influence their case.

Whispering is often offensive to a patient, and need not be called into use.

The nose should be kept clean by ordinary washing and the use of the handkerchief, and that not succeeding cotton swabs may be used and sprays of Dobell's solution or glyco-thymol diluted, one part to four of water.

ANTITOXIN TREATMENT OF DISEASE

The treatment of disease by means of injections of antitoxin promises in the future to supply the very best therapeutic measures. Theoretically, the treatment is founded on the most solid grounds; there is, however, much to be learned practically in its administration. The theory of the treatment depends on the fact that to the poisons or toxins developed by bacteria in the body there is produced an antidote or antitoxin which is the ultimate factor in overcoming an infection. That is to say, the system naturally resists bacterial toxins, and this resistance is antitoxin.

Experimentation found that there was a practical basis for this theory, and the antitoxin of diphtheria was produced and widely tested, and it now ranks as the best remedy for the treatment of diphtheria. In describing the method of preparing diphtheria antitoxin a very clear idea of the whole subject should be obtained.

An animal of already high resisting power to diphtheria is selected, this being in most cases a horse. This animal is then inoculated with a weakened or attenuated culture of diphtheria bacilli or with the toxins produced by the bacteria. Following this inoculation there is a distinct febrile reaction, and during the reaction the blood of the horse is found to have become very much more highly resistant to diphtheria. In other words, to guard against the poison introduced, certain chemical changes have taken place resulting in the formation of antitoxin. This process is then repeated several times with doses of bacilli or toxins of increasing strength. The blood of the horse is then taken, usually from the jugular vein, the corpuscles are separated, and the serum bottled up and sterilized.

The dosage, unfortunately, cannot be mathematically computed, and nothing but experience can teach us just how much or how little to give.

The antitoxin unit is a unit of strength and means one cubic centimetre of serum of such strength as to antagonize one hundred times the minimum fatal dose to a guinea-pig of two hundred and fifty grams' weight.

In the guinea-pig, as may be seen from this definition, the dose of antitoxin can be calculated to a mathematical certainty. Unfortunately, in dealing with a human being the subject of an attack of diphtheria, we are not able to judge just how much toxin is in his blood, and therefore how much antitoxin we are called upon to administer. It is usual to give from one thousand to two

thousand units at the onset and repeat the dose three or four times at twelve hours' interval.

In very severe cases at the onset larger doses may be given. Again, it is of importance in determining the value of antitoxin to consider at what stage of the disease it is given. It is very much more effective early than late, and indeed when used very late it is sometimes almost without effect. Five hundred units may be given to those exposed as an immunizing dose.

This short description of the diphtheria antitoxin should give an idea of the principles which apply in the case of other antitoxins in other diseases.

New sera are being made by experimenters, and already there are many in use,—antitetanic, antistreptococcic, antipneumococcic, and many others,—but certainly none have achieved the assured position in therapeutics that has been gained by antidiphtheritic serum.

There are certain drawbacks to the use of sera of any kind which are derived from a horse or indeed from any animal other than the one to be injected. Sudden deaths following the use of antitoxin are to be ascribed rather to the peculiar sensitiveness of the individual to the serum itself than to the antitoxin products themselves. People who suffer from any grade or variety of asthma should never be given animal sera and those who have shown unfavorable reactions to initial doses should be guardedly treated in respect to subsequent injections.

is laid bare and the needle thrust in with the most careful antiseptic precautions. The object of the injection of salt solution into the tissues or veins is to supply fluid to the general circulation, either because there has been a loss of blood through hemorrhage or because the fall of blood-pressure incident to the condition of shock due to the dilatation of great blood-vessels has become so great as to threaten cessation of circulation. A third and more recent therapeutic use of salt-water injections has for its object the diluting of toxins of infectious disease while circulating in the blood.

BLEEDING, LEECHING, AND CUPPING

Bleeding may be effected either by opening a vein, by use of wet cups, or by live or artificial leeches.

The method of VENESECTION is commonly adopted when large quantities of blood are to be extracted. A tourniquet of rubber, a towel, or some convenient substitute is twisted around the arm a short distance above the elbow with sufficient force to obstruct the return venous flow and thereby cause a swelling and prominence of the veins of the forearm. The vein usually selected for incision is the median cephalic, owing to its nearness to the surface and its safe surgical relations(it is situated at about the bend of the elbow to the outer side of the median line). The incision is made obliquely, and when the desired amount of blood is obtained the tourniquet should be loosened, and usually the flow of blood immediately ceases. An antiseptic dressing is then applied and the arm placed at rest. Blood may also be withdrawn from a vein by plunging the needle of an aspirator into the vein after the tourniquet has been applied, as already described.

The method employed in WET-CUPPING consists in the employment of a scarificator and an ordinary dry-cup apparatus. The dry cup is first applied and the air ex-

hausted by means of a small pump. The scarificator is then employed over this congested area and the dry cup immediately replaced and free suction begun. Dry cups may be applied by using the well-known apparatus consisting of glass cups and an exhaust-pump. Or, in the absence of these, an ordinary heavy glass egg-cup may be employed and the relative vacuum produced by rubbing a few drops of alcohol in the bottom of the cup, applying a match, and adjusting the cup just before the flame expires. In this method care must be taken not to burn the patient, and this is best accomplished by spreading but a small amount of alcohol in the cup and only at the bottom of the cup. It is well to remember that it is wisest to err on the safe side, and if the first cup does not grip, owing to an insufficient quantity of alcohol, it is a very simple matter to repeat the attempt with an increased amount. Wet cups are but seldom used nowadays and dry cups not a great deal more. They are most commonly applied at the bases of the lungs in beginning pneumonia or in delayed resolution in pneumonia, with the object of effecting local depletion.

LEECHING is still more rare than cupping. The *animal leech* is applied either contained in a test-tube or cylinder of paper with the head protruding and held against the skin over the area to be leeched. The leech may be encouraged to take hold by spreading a little milk or blood on the skin. After it has taken all the blood it requires the leech will let go its hold or this may be hastened by putting a few grains of salt on its head. Usually bleeding goes on for some little time from the leech-bite wound, due possibly to some secretion from the leech left in the wound which prevents coagulation of the blood. This is often desirable, and within reasonable bounds should excite no alarm. A dressing of dry gauze should be placed over the bleeding spot and renewed as often as becomes necessary.

A *mechanical leech* has been invented as a substitute for the animal one. It consists of a scarificator, pump, and small dry cup combined in one instrument, and is very effective on a smooth or soft surface, but cannot be used in very irregular places. Leeches are used over the mastoid in earache, over the abdomen in peritonitis, and less commonly in other situations.

CATHETERIZATION

Catheterization may be performed either with a glass, silver, rubber, or rubber and linen tube. Glass catheters are preferable for use in women. The catheter should be boiled before using, and much care should be exercised not to introduce any infecting material into the bladder.

The woman should assume a position flat on her back near the edge of the bed, if convenient, with the heels drawn up and caught on the bed rim. The meatus or opening of the urethra should be cleansed carefully with an antiseptic solution, the catheter when introduced having the convexity of its slight curve turned downward. In withdrawing the catheter it is well to place a finger over the free end to retain the few drops in the tube and prevent them falling on either the patient or bed.

Rubber catheters should be immersed in corrosive sublimate solution before being used. Silver catheters should be boiled. In catheterization of males the catheter should be lubricated with sweet oil, glycerin, or vaseline lightly applied. This is not necessary in the case of the female.

Catheterization, being attended by the risk of infection of the bladder and the kidney tract as well, should only be performed when the necessity is unavoidable. It becomes necessary very often in cases of distention, coma, unconsciousness, paralysis, stricture, stone in the bladder,

cystitis, and before gynæcologic operations. The neglect to relieve the bladder at regular intervals of those unable to urinate may be attended by very grave results.

USE OF THE STOMACH-TUBE

The stomach-tube may be used either to empty the stomach of poison, to obtain gastric contents for examination, to wash the organ either with plain water or solutions of drugs, or to feed those who, either from insane or suicidal impulse, refuse all food. The patient should, when possible, sit erect in a chair, protected as to the clothing by rubber sheets. A gag should always be inserted in the mouth as no matter how willing the patient may be to submit at first, there is always the risk that in consequence of the choking and discomfort which usually follow the introduction of the tube, the latter or the finger of the operator may be bitten. The tube should be oiled or covered with glycerin and introduced firmly, guided by the left forefinger, which is also used to pull the base of the tongue forward. After the tube has reached the stomach, water, milk, demulcent solutions, or drugs may be poured through the funnel-like expansion at the end, and a reverse current effected by lowering this end and thus invoking the principle of siphonage. To start the flow it is sometimes necessary to press several times the bulb-like expansion which is situated at about the middle of the tube.

In dealing with would-be suicides or insane people it is of great importance to watch the gag most carefully to prevent its slipping, and also to hold the patient's arms firmly, otherwise they may seize the tube and render further proceeding by mouth out of the question.

In those cases where, for the reasons before mentioned, a tube cannot be inserted by way of the mouth, the feeding or washing out of the stomach may be effected through the nose by a smaller tube.

THE ASPIRATOR

Aspiration of the pleural cavity is accomplished by means of an aspirator, consisting of a jar connected by rubber tubes and stop-cocks with a pump at the one end and an aspirating needle at the other. A relative vacuum is produced in the jar by means of the pump, the needle is thrust into the pleural sac containing effusion, and on the stop-cocks being properly adjusted the fluid begins to flow into the jar. If at any time during the proceeding the vacuum becomes exhausted it may be renewed by simply using the pump without change of position, remembering, however, to again properly adjust and readjust the stop-cocks. In the case of a large effusion, where several bottlefuls are to be withdrawn, it becomes necessary either to change bottles or pour out the contents of the one first in use and refill it again. This may be accomplished by turning off the stop-cock connecting with the needle and then removing the rubber cork from the bottle. Often the aspiration is accompanied or followed by weakness and faintness, and it is well for the nurse to have on hand some rapidly acting stimulant, such as brandy, whiskey, or aromatic spirit of ammonia. She should also have some sterile gauze, collodion, and strips of rubber adhesive plaster by the bedside with which to dress the wound after withdrawing the needle. It seems scarcely necessary to add, in these days of rigid cleanliness, that the whole operation must be conducted under the most careful antiseptic regulations. The skin over the site of puncture should be carefully prepared and, when time permits, should be covered with an antiseptic dressing. The needle should be boiled, and the hands of all concerned cleansed carefully and submerged in bichloride solution. In timid patients freezing of the skin surface by ethyl chloride is sometimes necessary, but is to be avoided, as a rule,

because the freezing makes the skin more resistant to the needle.

There is perhaps no apparatus so apt to be out of order as an aspirator. This is due to the fact that its integrity of action depends on its numerous joints being air-tight, and, through disuse, the washers contract or become cracked and allow air to enter. The nurse should always test the apparatus before it is taken to the bedside, either in hospital or private practice, as to the condition of the pump, the degree of vacuum produced, the permeability of tubes and needle, and the condition of the point of the needle.

CHAPTER VIII

Applications—Hot Bath—Foot Bath—Steam Baths—Turkish and Russian Baths — Sitz Bath — Counterirritation — Mustard-Plaster — Blisters — Cautery — Turpentine Stupes—Hot and Cold Compresses — Ice-Cap — Enemata: Nutrient, Laxative, Medicinal, Stimulant—Poultices—Douches: Vaginal, Nasal, Ocular—Gargles.

EXTERNAL APPLICATIONS

THE HOT BATH is used in medicine to produce sweating, to cause relaxation in such cases as kidney-stone or gall-stone attacks, and to counteract convulsions or convulsive tendencies. Steam and hot-air baths are used to produce free sweating, particularly in kidney diseases where poisonous matter which the kidneys should have eliminated is retained and may to some extent be withdrawn in the sweat.

The foot-bath is more or less relegated to the past as an old-fashioned method. The theory of its use is that by increasing blood-flow to the feet it diminishes the supply to some other congested area. In headache and colds it is of great use.

Hot-Water Bath.—The patient is placed in a tub containing sufficient water at a temperature of from 95° to 110° F. to cover his body, and is kept in for ten or fifteen minutes, when he is removed, covered with blankets, and allowed to sweat for a period not exceeding thirty minutes. During the bath more hot water must be added to the tub from time to time to maintain the temperature of the water. Cold cloths may be placed on the patient's head and water be given him to drink.

The effects of the baths must be watched carefully, as sometimes they produce faintness. Under such circum-

stances the patient should be removed, covered but lightly, and stimulants of quick action, such as whiskey or ammonia, administered.

Steam baths are given without removing the patient from his bed. The patient is placed naked on a blanket and a tent made of a blanket and rubber sheet supported by a bed cradle raised above him. The nozzle of a kettle containing boiling water is then introduced under the blanket at the foot of the bed and the supply of steam kept up by means of a spirit lamp or Bunsen burner burning under the kettle. The steaming process should continue for from fifteen minutes to half an hour, according to the physician's order or the patient's ability to stand it. After the bath the patient should be lightly dried, the bed remade, and the usual amount of bedclothes replaced. As in hot-water baths, so also after steam baths, the patient's condition should be narrowly watched and syncope forestalled or treated as previously directed. The spout of the kettle should be so directed beneath the blankets as not to pour the steam directly upon the patient's feet or legs and thus perhaps produce a severe burn.

Mustard is sometimes added to a hot bath, particularly in treating the convulsive seizures of children. The proportion is usually roughly stated as two handfuls to a tub.

The hot foot-bath may be given either in bed or out. If given in bed the foot-tub should be placed on the bed and the patient's feet placed in the hot water by bending up the knees. The water should be as hot as can be borne, and mustard may be added if desired. The patient should be carefully wrapped up about the knees to avoid exposure and cold.

Turkish and Russian baths are given in establishments erected for the purpose, and consist of the use of hot-air and hot-vapor baths alternately before plunging into

a cold swimming pool. These baths are dangerous to those who are in any way unsound, particularly if the heart or blood-vessels be the unsound tissues, and should only be taken by a patient when ordered by a physician. It is of importance, even for the well and strong, to rest for some time after taking one of these baths, as always there is a certain relaxation following free sweating and exposure to great heat.

The Sitz-bath, or hip-bath, is best given in a low-rimmed tin or rubber bath-tub. The patient sits in the tub with the feet resting on a stool or on the floor. The legs should be wrapped in a blanket and the upper part of the body covered up also. The water may be either hot or cold as directed, and massage of the hips, lower abdomen, and buttocks should be maintained during the bath. Such baths are indicated in some cases of pelvic congestion and painful menses.

COUNTERIRRITATION

Counterirritation is produced by provoking various degrees of inflammation in the neighborhood of another inflamed area. Formerly counterirritation was carried out more vigorously and more often than now, and issues, setons, and applications of the actual cautery were matters of every-day practice. To-day counterirritation is confined to less drastic means and is brought about by the use of mustard-plasters, iodine painted on the skin, blisters, and, rarely, the galvano-cautery.

The *mustard plaster* is a favorite home remedy for divers ills, and is made by mixing mustard and flour together into a paste with warm water. This paste is then spread on lint or old linen and applied to the skin surface. The precaution is taken of placing a thin bit of gauze or muslin between the mustard and the skin, in order that too much irritation may not be produced. The proportions of mustard and flour vary according

to the degree of counterirritation desired and the tenderness of the skin in the particular case. Usually the mustard and flour are mixed in equal parts and the plaster retained for from ten to twenty minutes or until the skin is thoroughly reddened. With children the plaster should be made in weaker proportion—one part of mustard to four of flour being the usual ratio. A ready-made mustard-plaster is now kept in stock at most drug-stores and is extensively used. It fulfils all the requirements of the home-made product with the exception of the warmth, which is a valuable feature of the freshly prepared plaster.

Mustard-plasters are applied to the chest in the beginning of attacks of bronchitis, and even in pneumonia; in conditions of acute gastric or abdominal pain, and more rarely are applied to the soles of the feet and the nape of the neck in conditions of unconsciousness.

Counterirritation may also be effected by painting iodine on the skin, and, if repeated on the same area or if applied to tender parts, considerable reaction is marked by burning pain, redness, and desquamation. Where a gentler action is required iodine may be diluted with tincture of belladonna in equal parts. Iodine is applied to the chest wall in pleurisy, particularly when of the dry variety, sometimes in bronchitis, and over joints affected with subacute rheumatism. It has many more uses in surgery than in medicine.

Blisters are produced by applying plasters of cantharides (Spanish fly) directly to the skin. These plasters are cut of the size desired, placed on the skin surface, which must be first carefully cleansed, and allowed to remain for a period of four to eight hours or until such time as a blister shall have formed. When the blister is well formed the plaster should be removed, the fluid drained out, and the inflamed area dressed with antiseptic precautions with a mild boracic-acid ointment.

Blisters may be produced by other preparations of cantharides, such as cantharidal collodion, and cantharidal cerate. When these are used, precautions must be taken to prevent the blistering solution or ointment from spreading beyond the desired limits. This may be accomplished by applying the irritant through a hole cut in a piece of blotting-paper held firmly against the skin or by surrounding the area to be blistered with vaseline.

Blisters are used over painful nerves in neuralgia or neuritis, over the cardiac area in pericarditis, or the chest wall in pleurisy, over the lumbar area in lumbago, at the base of the brain in meningitis, sometimes in any locality for moral effect in nervous conditions, and in a variety of other conditions too numerous to mention.

Cantharides sometimes produces suppression of urine and painful urination. Such conditions are usually preceded by pain in the back, and on such pain arising the blistering material should at once be removed and the patient, if possible, placed in a warm bath.

Blisters should never be placed at points where the bone is nearly underlying the skin, as the ulceration produced might expose the bone. In those whose vitality is depressed, and in children, blisters should not be allowed to remain on as long as in the case of average adults, as the same effect is produced in a shorter time.

The actual cautery is seldom used in medicine. Sometimes, however, the red-hot blade of a galvano-cautery is lightly touched to the back several times in cases of lumbago or in the hope of relieving the pains of locomotor ataxia. The actual cautery is also used to produce a moral effect in certain neurotic conditions.

There are other methods of producing counterirritation which are less commonly used because, for one reason or another, not so desirable as the methods described.

Turpentine stupes are made by wringing out a piece of flannel in very hot water and then sprinkling the hot

flannel with thirty drops of turpentine. The stupe is then placed on the desired spot, covered with dry flannel, a piece of blanket, or oiled silk, and allowed to remain on for ten or twenty minutes or until the desired result is obtained.

Hot stupes are prepared in the same way without the addition of turpentine.

Turpentine stupes are chiefly used in treating abdominal pain or distention, and are of especial benefit in the abdominal distention of typhoid fever.

HOT AND COLD COMPRESSES

Cold compresses are best prepared by having at or near the bedside a cake of ice in a basin on which several compresses may be cooling at the same time, and may be applied in rotation to the affected spot while the one already used may again be cooled by being replaced against the ice.

Cold compresses may be used to relieve headache, to combat inflammation, usually in surgical diseases, to arrest hemorrhage, and sometimes as a substitute for cold-water bathing or sponging in typhoid fever.

Sometimes ice-poultices are used in the same class of cases and to obtain the same sort of results as the cold compresses. Much ingenuity must be then used to prevent the melting ice from escaping from the poultice and wetting the bed and patient. On the whole, it is usually more satisfactory to use an ice-cap or several ice-caps in place of the poultices if the area to be covered is as large as in the case of the abdomen.

Ice-caps and ice-bags are used to allay inflammation and relieve pain.

Ice-caps are applied to the head in conditions of cerebral hemorrhage, meningitis, and in the delirium and headache accompanying any febrile condition.

Ice-bags are often applied to the neck in sore throat,

tonsillitis, diphtheria, or quinsy, and in pleurisy, pneumonia, appendicitis, and pericarditis over the affected parts, often with great benefit.

ENEMATA

Enemas or clysters are given to move the bowels, to do away with flatus, to nourish the body when for some reason the stomach cannot perform its function, to check diarrhœa, to stimulate, and to apply local medication to the intestine. Laxative enemata may consist of water alone or may contain laxative drugs.

The most common type of enema is that of soap and water, which is made by mixing soap with warm water until the suds are plentiful. This mixture while still warm is injected into the rectum and retained for ten or fifteen minutes if possible, and then a mild effort at expulsion should be made.

The quantity of fluid injected should vary from six or eight ounces in children to one or two pints in adults.

The Davidson syringe is usually the best for this purpose, and the nozzle, after being oiled or greased, should be gently inserted in the rectum to a depth of two or three inches and the fluid allowed to flow gradually in. Force in introducing the nozzle is unnecessary and may be very harmful, as the constipation might be due to the presence of a fistula, abscess, or hemorrhoids, or the rectum may be blocked with hardened fæces or a foreign body.

The effect of the enema is to loosen the fæces in the lower bowel by solution and reflexly to start up peristaltic action of the bowel above.

Certain drugs may be added to hot water to increase the efficacy of an enema or to obtain some special result, as, for instance, the expulsion of flatus.

Turpentine, magnesium sulphate, and castor oil are the most common ingredients when either of these results

is desired, and in some instances all of these may be used in combination.

Hot coffee enemata are sometimes given as a stimulant in cases of opium poisoning; whiskey and brandy also for a stimulating effect in various conditions. Six or eight ounces of strong coffee should be injected into the rectum at a time and repeated in an interval of an hour or so if necessary. Whiskey or brandy may be similarly used in doses of one to two ounces diluted with equal parts of water.

Injections of hot salt solution are prepared by adding two drachms of salt to one quart of hot water. This whole amount is injected into the rectum in cases of shock or collapse, and has a stimulating effect by supplying fluid to the collapsed blood-vessels.

Nutrient enemata are given when, for some reason, feeding by mouth is impossible or dangerous. Such conditions are presented in obstinate and uncontrollable vomiting, gastric ulcer, and cancer of throat.

These enemata should be preceded by a preliminary enema of warm water for its cleansing effect on the bowel. This preliminary enema, however, should not be given if the bowel is irritable and unlikely to retain the nutritive enema which is to follow or if the patient is very weak and likely to suffer from the dual proceeding.

To obtain the best results in rectal feeding the contents should be injected as high into the bowel as possible, as but little absorption takes place in the rectum itself. Then, again, the quantity should not be too great, particularly at first, and the feeding should not be given with too great frequency. The quantity should not exceed four to six ounces given not oftener than every third hour. The contents of the enema may consist of broth, peptonized milk, eggs, albumin water, beef-juice, or beef-extracts.

A commonly used enema consists of four ounces of peptonized milk thoroughly mixed with the whites of two eggs.

Rectal feeding, if carefully done, may be the sole support of a patient for a long period. At any indication of rectal irritability during the course of prolonged feeding, the amount of the enema should be reduced and its frequency diminished.

POULTICES.—Poultices are used to convey heat and moisture to inflamed and painful areas. Flaxseed is the most common ingredient of poultices, but other substances, such as bread, mush, hops, or tea-leaves, may be used. Poultices are very commonly used in surgery to relieve pain, to promote and hasten suppuration (*i.e.*, to bring an abscess to a head), and to help to separate sloughs. In medicine they are used to relieve pain and congestion in pneumonia, pleurisy, appendicitis, rheumatism, and most commonly in the treatment of boils.

Flaxseed poultices are made by mixing the ground seeds, or meal, with boiling water until of the consistency desired. This mixture is then spread on muslin or lint and placed, while still hot, over the affected area, either in direct apposition with the skin or with a bit of gauze or thin muslin interposed. The whole should then be covered with some good non-heat-conducting material, such as flannel, in order to retain the heat as long as possible. In making these poultices care should be taken to so fold in the edges that the ingredients cannot escape and get on the bed or the patient's clothes; also, if the poultice is made at some distance from the patient, some device should be adopted to keep it hot until applied. It should be changed as soon as cool, the time varying with the size of the poultice.

Jacket poultices are prepared in the same way and are shaped after the manner of a jacket without sleeves or arm-holes. They are used to some extent in pneumonia of children, but some physicians consider that

they impede the breathing, and in so doing counterbalance any good they may do in other ways.

The charcoal poultice is used as a deodorizer in certain foul-smelling conditions, such as gangrene. Usually charcoal and flaxseed meal are mixed together in nearly equal parts, the flaxseed being in excess. Free charcoal is sprinkled over the surface, and the poultice applied directly to the diseased portion.

There are other kinds of poultices less frequently in use,—yeast, starch, onion, tea-leaf; also hot, wet, antiseptic dressings are used poultice-like in erysipelas and other conditions.

Bread may be substituted for flaxseed when the latter cannot be obtained, the poultice being made preferably of stale bread soaked in boiling water and reduced to a mush-like consistency before being applied.

DOUCHES

Douches are given to apply medicaments to surfaces, such as the eye, nose, or vagina, which cannot be conveniently treated by other methods. Sometimes no drugs are used, the douche merely consisting of either hot or cold water and depending for its virtue on the temperature.

Vaginal douches are used in very many conditions, among them being chronic and acute catarrh of the uterus or vagina, pelvic congestion of any kind, and after labor. Simple douches may consist of hot water or hot water with some common salt added. From one to three quarts of water, as hot as can be conveniently borne, should be used, the patient lying on her back on a douche-pan. If the douche-pan cannot be had, a Kelley's pad or a sheet of rubber and blankets may be substituted. For special influence on the vagina certain drugs, such as corrosive sublimate, creolin, boracic acid, silver nitrate, and others, may be added to the hot water and the douche given as already described.

For various reasons, particularly if the douche is to be self-given, the patient often prefers not to take the treatment in bed. Under such circumstances it may be convenient to take the douche while lying down in the bath-tub with the hips elevated on a low stool or a board.

The tip of the fountain syringe should be introduced for a distance of three inches and the force of the stream may be regulated by the height of the douche bag.

Intra-uterine douches should only be given by the physician.

Douching of the eye is best accomplished by means of an ordinary eye-dropper. The patient's head should be tilted far back, the lids gently separated, and the fluid, which should always be luke-warm, introduced without too great degree of force. A piece of cotton, a towel, or handkerchief should be held against the cheek to absorb the overflow of the eye-wash. Boracic acid, sulphate of copper and zinc, cocain, silver nitrate, argyrol, and many other drugs are used in various strengths in these eye-washes.

Nasal douches may be given with either a fountain syringe or an ordinary glass or rubber syringe. The patient should sit leaning forward with the chin depressed to favor the return of the douching fluid through the mouth. The tip of the syringe should be held just within the nostrils, and no very great degree of force should be used.

More commonly, medication of the nasal cavities is carried out by means of the *nasal spray*. The spraying as well as the holding of the spray should be managed with one hand while with the thumb of the other the nostril is tilted up, and the tip of the nozzle may be guided by being placed against the edge of the thumb rather than in the patient's nostrils. There is an additional advantage in this method in dealing with very timid patients or with children who flinch from the

treatment, and uncomfortable lacerations of the nasal cavities are thus avoided.

In douching the ear an ear-douche bucket may be suspended from the ear or a pus pan held beneath. The syringe should be introduced in such a way that plenty of room for the free egress of the solution should exist, as otherwise severe consequences might follow. The douching should be given very gently, particularly at first.

GARGLES

Oftentimes a nurse is called upon to prescribe some gargle for a sore throat pending the arrival of a physician, and under such circumstances she should direct the use of some such well-known and soothing one as salt and water in strength of one teaspoonful to a pint of water; chlorate of potash, one teaspoonful to a glass of water; listerine, one part to four of water; hydrogen peroxide, diluted one-half with lime-water or plain water.

Glyco-thymoline also is becoming almost a household remedy, and may be used, diluted three or four times with water, every two hours or so.

These gargles just mentioned are mildly antiseptic and soothing.

Astringent gargles are used in severe relaxed conditions of the throat, as, for instance, after a quinsy. Glycerole of tannin and solutions of astringent salts of iron are perhaps most common; none of these latter, however, should be given unless ordered by a physician.

Sometimes, for one reason or another, it is more desirable to treat the throat by means of a SPRAY. Any of the first-mentioned mild solutions may be thus used and the nose similarly treated afterwards. Silver-nitrate solutions, in strength ranging from one drachm to the ounce to ten grains to the ounce, may be applied to the throat with a cotton swab, but should not be used as a gargle. With many this is a favorite treatment in beginning tonsillitis and pharyngitis.

CHAPTER IX

Typhoid, or Enteric—Typhus—Simple continued Fever—Scarlet Fever—Measles—Rubella—Variola or Smallpox — Varicella Cerebrospinal—Epidemic Parotitis—Whooping-Cough—Diphtheria—Influenza, or Grippe—Erysipelas—Toxæmia, Septicæmia, and Pyæmia — Rheumatism — Dysentery — Malaria — Tetanus—Physical Diagnosis—Pneumonia—Tuberculosis.

SPECIFIC INFECTIOUS DISEASES

TYPHOID FEVER, OR ENTERIC FEVER.—Typhoid fever is an acute febrile, specific, self-limited, infectious disease. Acute because abrupt in onset, severe in symptoms, and short in duration; specific because due to a distinct organism which, when active, produces this particular disease and no other; febrile because accompanied by fever; self-limited because of its course being definitely limited to four weeks, and infectious because it is capable of transmission from one person to another by means of water, food, or flies contaminated with excreta from typhoid cases.

Typhoid fever is characterized by a definite course of four weeks' duration (during the first week the temperature slowly rises, being higher in the evening than in the morning; during the next two weeks the temperature remains at an average level, while the last week is occupied with the gradual descent or defervescence of the temperature to the normal), by fever higher by night than in the morning, by headache, nose-bleed, diarrhœa, and a peculiar diagnostic eruption, which appears on the body at the end of the first week.

Etiology.—Typhoid fever is due to the bacillus of Eberth, which enters the body by the mouth in contami-

nated water, food, milk, and sometimes through the medium of flies, and thus gains access to the intestinal tract, where it is absorbed and produces the specific disease. The germ is found in urine, fæces, blood, bile, and in lesions of the intestine, spleen, and mesenteric glands. As has been previously stated, epidemics of typhoid fever have been due to contaminated drinking water, to milk diluted with impure water, and more rarely to food (such as oysters). Another possibility may be mentioned, though of great rarity, and that is the manner of transmission from beating mattresses or clothes contaminated by excreta of typhoid patients. The great importance of the knowledge of the methods of transmission of this widespread and fatal disease may be seen when we consider how greatly may its spread be limited by attention to the disinfection of urine and fæces, bed linen, and underclothing. For our own personal safety, as often as the patient, the bed-clothes or utensils about the sick-bed are handled, we should at once disinfect our hands lest infected material be carried to the mouth.

Typhoid fever occurs independently of age, sex, or race. It is more common in the spring and fall. One attack confers immunity against subsequent ones. A *familial* predisposition is noted,—that is, some families seem to be unusually susceptible.

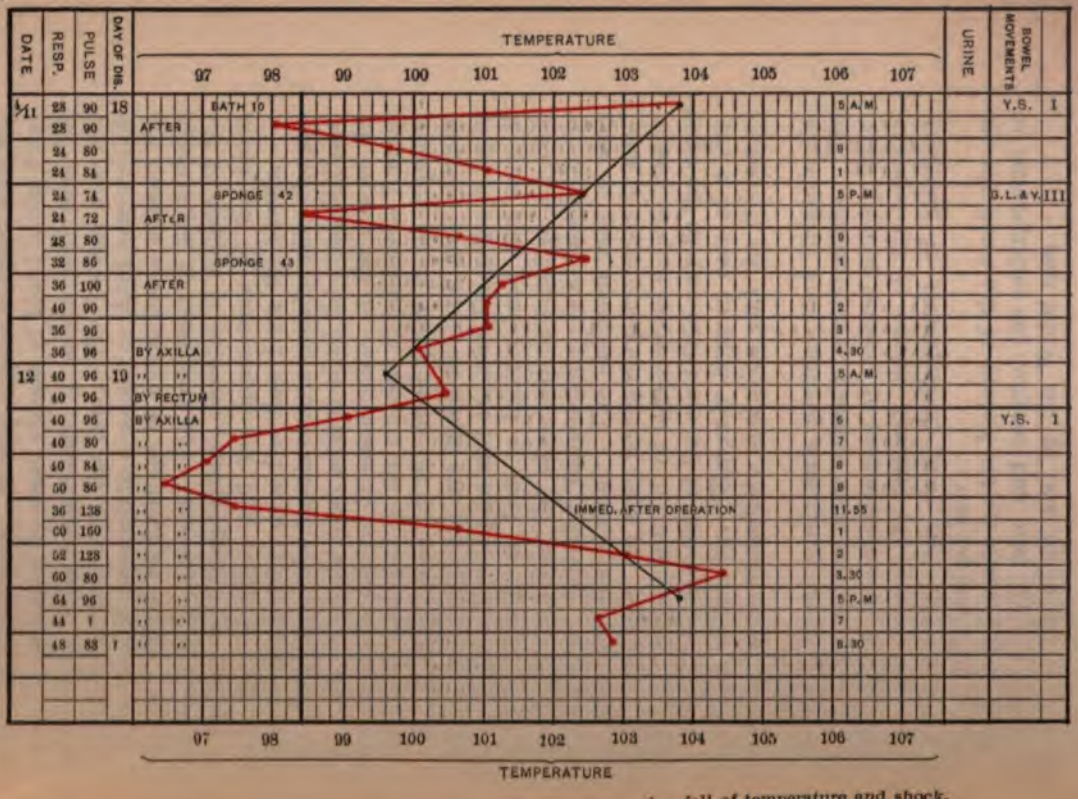
Symptoms.—The period of incubation ranges from fourteen to twenty-one days. During this period the prodromes may be absent or slight. The disease proper is ushered in by a chill or chilly sensations with some fever and headache. The bowels are either constipated or diarrhœa is present, and gradually, with the daily increase of fever, the symptoms appear,—the coated tongue, rose spots, abdominal distention, enlarged spleen, and typhoid stools. The course of the fever is diagnostic. Any abrupt rise or fall of temperature not due to baths or any recognized cause, should be noted and reported

to the attending physician. The pulse-rate is out of proportion to the temperature, frequently being below 100 when the temperature is as high as 102° F. The tongue is heavily coated, but, as the disease progresses becomes cleaner at the tip. The rose spots appear at the end of the first week, and are situated mainly on the abdomen, chest, and back, more rarely on the extremities, and most rarely, if indeed ever, on the face. These spots disappear on pressure. The abdomen is distended generally, and in the right iliac region gurgling of the intestines can be produced by pressure. The spleen is enlarged and somewhat tender. The bowels are generally constipated at first, but at the end of the first week usually become loose and of the typical pea-soup variety.

Delirium may be included as a symptom, as in very severe cases it may be expected. Sometimes the delirium is wild and the patient strikes at attendants and tries to jump out of the windows and performs acts of violence. In other cases the patient merely becomes comatose and stupid, muttering and picking at the bed-clothes, lying in the same attitude for hours at a time, not voiding urine, and having involuntary passages from the bowels. Such patients require most careful watching and nursing. Their position in bed should be changed every two hours, drink should be given them regularly, and care of lips, tongue, and mouth should be taken, while evacuation of the bladder should be secured at regular intervals. Never leave a typhoid fever patient alone in a room for an instant. The quietest patients may suddenly jump out of the window or commit any act of violence that may enter their head.

Complications.—Excessive diarrhœa and excessive constipation are complications of gravity, the first from its exhaustive effect and the second from its likelihood of producing intestinal hemorrhage. Hemorrhage from the bowel is a grave complication. It occurs but rarely

TYPHOID FEVER (PERFORATION)



before the third week. It may appear without warning or may be preceded by small streaks of blood in the fecal evacuations. The hemorrhage, if severe, may soak the bed and even flow over the floor. The patient may die at once or may succumb to a second or third hemorrhage later on. If the hemorrhage be of moderate amount the patient usually recovers. The symptoms of hemorrhage are reduction of temperature, decrease in volume of the pulse, loss of color, and the appearance of the blood either in the stool or as a free flow from the bowels.

Perforation of the bowels occurs usually after the second week, and is the most serious of all the complications. The symptoms depend to some extent on the size of the perforation and also on the amount of adhesions formed in the neighborhood of the ulcer prior to its rupture. Usually the symptoms are those of shock and collapse. The patient's face is pale and anxious, the pulse is rapid and compressible at first, to become hard and wiry if peritonitis develops, the skin and extremities are cold and clammy, and the temperature falls abruptly to a point below the normal. The abdomen may or may not be distended. In cases where the perforation is small the signs of shock and fall of temperature may be absent, and the only indication of the condition may be the signs of a local peritonitis. The only hope in case of a perforation lies in immediate operation and the closing of the hole.

Bronchitis and pneumonia, pleurisy, and Bright's disease are among the more common complications. The chief sequelæ are enfeeblement of cerebral activity, milk-leg or phlebitis of the femoral, œdema of the legs and hemorrhage into the skin, derangement of intestinal activity, and loss of hair.

Diagnosis is made by the history of the onset, the appearance of the face and tongue, the enlargement of the spleen, the spots, and by the Widal test.

Anatomic Alterations.—Characteristic lesions are enlargement and ulceration of the lymph follicles of the small intestine, enlargement of the mesenteric glands and of the spleen.

Treatment.—Absolute rest in bed, liquid diet, and the use of cold water make up the sum total of the routine treatment of typhoid fever. There is no specific treatment of the disease, and the tendency of physicians is to give as few drugs as possible. The rest in bed is most necessary, and the earlier a patient takes to his bed after the onset of typhoid the milder the disease, as a rule, will be. Many people have practically killed themselves by ignorantly attempting to work off by violent exertion the feelings produced by the prodromes of a commencing typhoid fever. The liquid diet is of importance because of the ulcerated condition of the intestine and the danger of solid food producing hemorrhage or perforation. If the diet be of milk alone, it is often necessary to dilute the milk with lime-water or soda-water. In the case of children over-feeding with milk produces marked constipation, which may even proceed to the condition of fecal impaction.

At the onset of typhoid fever it is customary to give calomel, either in divided doses or in one large dose, sufficient to produce free purgation. Calomel increases the flow of bile and also the intestinal secretion, and is an intestinal antiseptic, and for these reasons is perhaps the best laxative that can be given.

In the early stages of typhoid patients complain greatly of headache, and this may be relieved by an ice-cap. In the event of that not succeeding, small doses of phenacetine or antipyrin may be given. Sponging or tubbing is begun as soon as the temperature reaches 102° or 102.4° F. Salol, beta-napthol, thymol, and various other antiseptics are given with a view of combating the poisons generated in the intestines by the typhoid bacilli. In case of hem-

orrhage the patient should be kept perfectly quiet, the foot of the bed should be elevated, ice-bags applied to the abdomen, and food and drink temporarily withdrawn. Opium is administered for its quieting effect on the bowels, as well as generally, and astringents, such as acetate of lead, tincture of chloride of iron, adrenalin, and gelatin, for the purpose of stopping the hemorrhage. In case of perforation all food and drink should be withdrawn. The only chance for the life of the patient lies in immediate operation. Stimulants are given during the course of the disease when necessary. Delirium is treated with bromides, codeine, morphine, and chloral. After the temperature has remained at normal for one week, soft diet may be cautiously begun, and following that a bed-rest may be tried, and gradually the patient may be allowed to get about.

It has been claimed that the great reduction in the mortality of typhoid fever since the advent of the cold-water treatment has been not alone due to the water, but also to some extent to the careful nursing which the system demands. The nurse should enforce discipline in the sick-room; should see that ventilation and light be plentiful; that excreta of all kinds be promptly removed; that the patient be kept clean; that the bed-clothes be of a proper degree of warmth; that bed-sores do not form; and finally, that in the routine pursuit of her duties any and all departures from the ordinary course of the disease should be at once reported to the physician.

Relapses occur in a certain number of cases, and usually at about the fourth or fifth week. Sometimes there may be several relapses in succession. As a rule, a relapse is shorter and less severe than the original attack.

The term *walking typhoid* is used to designate those cases in which the symptoms are slow and mild in onset, and the disease is well advanced before the patient feels

sufficiently ill to consult a physician and discover the serious nature of his illness.

TYPHUS FEVER (SHIP AND JAIL FEVER) was formerly confused with typhoid. It is a specific, contagious disease of unknown cause. Typhus is predisposed to by overcrowding in prisons, holds of ships, and such places, and is fostered by unhygienic surroundings. It is rarely seen in this country. It is more abrupt in onset and shorter in course than typhoid and generally ends by crisis. The treatment is much along the lines of the treatment of typhoid. Strict isolation is of the greatest importance in order to check its spread.

SIMPLE CONTINUED FEVER.—As fever itself has long been regarded as a symptom rather than a disease, the fore-mentioned title is regarded by some as a confession of ignorance; an acknowledgment that the source of the fever is not discovered. Be this as it may, we undoubtedly encounter febrile disturbance in which no other sign or symptom than the fever can be discovered, and in which blood reactions for typhoid and paratyphoid are negative, where we are unable, owing to lack of evidence, to give any descriptive title, and are obliged to fall back upon the old-fashioned and unscientific nomenclature.

Such fevers may last a few hours or several days. In one instance in my own practice it continued for two weeks. The temperature may be as high as 102° or 103° F., and is accompanied by malaise, headache, coated tongue, and scanty urine, preceded by chilliness or in some cases by a pronounced chill. The ending may be abrupt or gradual, and convalescence is rapid. My own observation has led me to the belief that long-continued mental strain is a cause in many instances.

The treatment consists of rest in bed, liquid or semi-solid diet, and sponging with cool water several times daily. Medical treatment should be symptomatic. Head-

ache should be relieved by phenacetine and guarana or an ice-cap. Laxatives should be exhibited when necessary, and sulfonal, trional, and bromides for insomnia.

SCARLET FEVER.—Scarlatina is an acute, contagious disease characterized by a general rash and a sore throat. The specific germ of scarlet fever has never been detected. Scarlatina appears in epidemic form, and is most severe in autumn and winter. Children are more frequently attacked than adults, and one attack generally confers immunity against subsequent ones. The contagion develops with the rash, and is most intense during desquamation. The poison is very tenacious of life and may live in clothing, mattresses, and the plaster of walls for months and even years. The disease may also be carried long distances in the clothing of nurse or physician and conveyed to others. Nurses and physicians who have been exposed to scarlatina should not attend or even approach surgical or labor cases. The throat condition frequently resembles diphtheria, and indeed diphtheria not infrequently is found associated with scarlet fever.

Morbid Anatomy.—The rash disappears after death. The throat conditions are those of inflammation, tonsillitis, and pseudomembranous pharyngitis, according to the type. There may also be enlargement of the glands of the neck and œdema of the tissues of the neck. Endocarditis, pericarditis, nephritis, and middle-ear disease are not uncommon complications.

Symptoms.—Incubation is from one to seven days, generally from two to four. The invasion is sudden; a chill at onset is rare, while vomiting or a convulsion is common in children. Temperature at once rises to 104° or 105° F., and at the end of the first twenty-four hours the rash develops as a general red flush with punctiform spots. The face, while frequently very red, often escapes the rash. The tongue is at first coated, yet with the red points of the swollen papillæ of the tongue showing

through. Later, the coating wears off and the typical "strawberry tongue" is presented. The throat shows changes varying from a simple redness to the most violent pseudomembranous inflammation of throat and nose, even extending down the trachea to the bronchi.

With the subsidence of the rash desquamation sets in, and lasts from two to even eight weeks, and during this period contagion is to be most feared.

Malignant scarlet fever cases are sometimes overcome by intense poisoning and die in twenty-four to thirty-six hours. The temperature may be as high as 107° to 110° F.

Hemorrhagic Form.—Hemorrhage may occur in the skin and mucous membranes, or there may be blood in the urine, and nose-bleed.

Anginose Form.—Anginose form is the term applied to that form in which the symptoms are concentrated in the throat,—*i.e.*, where the membrane is widespread and deeply attached.

Complications.—Nephritis is common in the second or third week, or may even come on late in convalescence. Arthritis, cardiac and ear complications are not uncommon. The child should be isolated for at least five weeks or until after desquamation has ceased.

Prognosis.—The younger the child the greater the danger. Unfavorable signs are high temperature, severe nephritis, severe pseudomembranous sore throat, and hemorrhage.

Treatment.—Isolation, rest in bed, and milk diet are the chief measures of treatment. The child should wear a light flannel night-gown. Sponging with warm water daily, and when desquamation begins, daily rubbings with oil or carbolated vaseline should be practiced. The mouth should be washed with antiseptic lotions, and if the throat conditions be severe ice may be applied to the neck and antiseptic solutions to the throat by means of

a cotton swab. The ones of most value are (1) Loeffler's solution (menthol, 10 grams; toluol, 36 c.c.; liq. ferri sesquichlorate, 4 c.c.; alcohol, absolute, 60 c.c.); (2) corrosive sublimate, 1:1000, and (3) carbolic acid, 3 per cent. in 30 per cent. alcohol. Temperature may be controlled by sponging with tepid water, or that failing, with a gradually cooled bath, beginning at 80° F. A cold pack may also be necessary. Treatment of medicinal nature is expectant. Weakness calls for stimulation. Delirium may be combated with sedatives and hydrotherapy, and kidney complications with hot-air baths, purgatives, and diuretics.

MEASLES.—An acute, very contagious disease, characterized by a rash and catarrhal symptoms of nose, eyes, and throat at the onset. Exact etiology is unknown as yet. Children are more often attacked than adults; both sexes are equally affected. Generally, immunity is conferred by one attack, but sometimes not. The disease is readily conveyed by a third person or by fomites.

Pathology.—The disease, very rarely fatal in itself, is, through its complications, one of the most serious diseases of children. The skin is hyperæmic and the mucous membranes are in a catarrhal condition, especially those of the bronchi. The fatality of measles is due to the complications of bronchopneumonia and to tubercular processes. The bronchial glands are always swollen.

Incubation.—Generally fourteen days. *Invasion* begins with chilly sensations, followed by fever, coryza, sneezing, lachrymation, and redness of the eyes and cough, the latter developing at the end of twenty-four hours. As measles more than any other disease is associated with catarrhal symptoms, such symptoms as above detailed occurring when measles is epidemic should arouse suspicion and lead to the isolation of the child before the rash appears. The tongue may be coated

and the rash may appear first on the soft palate and cheeks before coming out on the face. Minute dark red spots with bluish-white centre often appear on the inner surface of the lips and cheeks before the eruption on the skin. They are known as Koplik's spots. The child may also vomit and have headache.

Eruption appears, generally on the fourth day, on the cheeks and forehead as papules, which rapidly develop over the whole body. These papules have a crescentic outline which often is of importance diagnostically. The cervical lymph glands are likely to be swollen when the eruption has come fully out. The symptoms persist after appearance of the rash, and on the fifth or sixth day generally subside, and fine branny desquamation takes place.

Occasionally hemorrhagic measles is seen in which the eruption, instead of being merely hyperæmic, is hemorrhagic, and bleeding may also occur from the mucous surfaces, and death frequently results.

Complications and Sequelæ.—The most common is bronchopneumonia due to extension of the inflammation from the bronchial tubes into the lungs. This is especially seen in children in institutions and among the indigent classes, and in such cases it is a most serious complication and is the cause of the great mortality from measles.

Laryngitis, stomatitis, cancrum oris, catarrhal inflammation of middle ear, conjunctivitis, and intestinal catarrh are among the most common of the serious complications. Of *sequelæ*, tuberculosis is most serious, either of the glands or as tuberculous bronchopneumonia.

Diagnosis is readily made by the appearance of the rash following several days of fever, accompanied by sneezing and catarrhal symptoms. The presence of Koplik's spots associated with catarrh and fever are pathognomonic.

Severe type of smallpox, 7th day.

Treatment.—Isolation should be insisted on as soon as there are grounds for suspecting the disease, as it is highly contagious before the rash appears. A light diet, or even an exclusive milk diet, should be prescribed if the case be severe and the temperature high. Particularly should the patient be protected from catching cold. The eyes should be protected from direct sunlight or glare of any sort. The nose should be sprayed with Dobell's solution, the mouth and teeth kept clean, and the patient bathed with lukewarm water daily. The bowels should be opened by calomel, and hot baths administered should the rash not come out properly. Paregoric, ipecac, and squills may be prescribed to loosen the cough and promote free expectoration. During convalescence care should be taken not to allow the child to catch cold and so develop pneumonia and perhaps tuberculosis.

RUBELLA (RÖTHELN, GERMAN MEASLES) is less severe than measles; it is contagious, and has a rash generally distributed over the whole body, associated with sore throat and slight constitutional disturbances.

Symptoms.—Similar to but less in degree than in measles. Eruption appears at the end of the first twenty-four hours, and is also seen in the mouth and throat, and the color of the rash is brighter than in measles. A very common symptom also is enlargement of the glands of the neck, particularly the post-cervical chain. Complications are rare.

Diagnosis is not difficult, as a rule; the rash must be distinguished from that of true measles. A clear history of but one day's illness before the appearance of the rash would exclude true measles altogether.

Treatment consists in use of simple febrifuges and rest in bed if necessary.

SMALLPOX, OR VARIOLA.—An acute infectious disease characterized by an eruption which begins as a papule

and becomes successively vesicle and pustule. As a rule the mucous membranes are also attacked.

Etiology.—The cause is not yet known, though the disease is undoubtedly due to a micro-organism. It is highly contagious. Vaccination, discovered by Jenner in 1796, may be regarded as an absolute protection for one year. Age has little to do with frequency of smallpox. It is, however, particularly fatal to young children. Sex has no influence on frequency of attack. Negroes are very susceptible, and in them the mortality markedly greater.

Before the great discovery of vaccination by Jenner in 1796, epidemics of smallpox appeared frequently and ravaged whole countries and even whole continents. Especially is smallpox fatal among semi-civilized or barbarous people. The North American Indians and the Mexicans literally died by thousands after the disease had been introduced into this country by the Spaniards.

Since Jenner's great discovery, which will cause his name to go down to posterity for all time as one of the greatest benefactors of the human race, these sweeping epidemics have become less and less, and the disease would be stamped out of existence if vaccination were carried on in an ideal way. There are outcries raised periodically against vaccination, and even attempts made to legislate against it, but most fortunately it is compulsory in all our schools, and the evidence that the disease in its old and terrible forms has been almost eradicated and that, through vaccination, nurses and physicians are able to handle the most violent cases with perfect freedom from danger stands like a rock against all the assaults of the body of cranks who are all too numerous in a world too prone to be misled. Vaccination may be regarded as producing immunity from smallpox for at least one year and as exerting a modifying influence for five or six. Varioloid is the

name applied to the modified form of the disease as it occurs in vaccinated people.

Pathology.—The eruption appears over the whole body, being particularly marked on the face and on the back of the hands, feet, and wrists. As already stated, it goes through the stages of papule, vesicle, and pustule. The eruption also is present in the mouth, tongue, bronchi, pharynx, œsophagus, and sometimes in the stomach and intestines. In hemorrhagic forms hemorrhage is noted in the various organs and in the mucous and serous surfaces. The spleen is enlarged and the liver and heart may show fatty changes. There are three clinical forms of smallpox: (1) *Variola vera,*—(*a*) discrete, (*b*) confluent; (2) *variola hæmorrhagica,*—(*a*) purpura variolosa, or black smallpox, (*b*) hemorrhagic pustular; (3) *varioloid.*

The *incubation* is commonly from nine to fifteen days.

Invasion is abrupt, with a chill in the case of adults or a convulsion in that of children.

Severe headache, vomiting, and most severe backache are also present, the latter being a most important diagnostic sign in the early stage. On the fourth day the eruption appears, first on the forehead and wrists, rapidly becoming general, and with its appearance the febrile symptoms diminish or even disappear altogether. On the fifth or sixth day the papules become vesicles and are depressed at the apex, causing the umbilication characteristic of the eruption. By the eighth day the vesicles become pustular and yellow in color, the umbilication disappears, and the fever and constitutional disturbances reappear. This condition lasts but about twenty-four hours in the discrete cases, when the pustules rapidly dry up and the scabs are thrown off. The amount of pitting is dependent on the depth of the eruption.

In the confluent form the general symptoms are more severe, but the confluence does not take place until the

pustular stage is arrived at. In this form there is great swelling of the hands and face and great enlargement of the glands of the neck, and in severe cases, where the whole face, swollen and distorted, becomes one large subcutaneous abscess, it is easy to understand the horror which the disease inspires. Death usually occurs from the tenth to the eleventh day. Hemorrhage occurs in two forms,—viz.:

1. In purpura variolosa: the onset here is very severe, with a diffuse hyperæmic rash appearing on the second or third day, followed by punctiform hemorrhagic spots. The spots grow larger and the rash more hemorrhagic until the whole body may become plum-colored. Hemorrhages into the conjunctivæ occur, and hemorrhage from mucous surfaces also. Death occurs from the second to the sixth day, often before the development of the usual eruption. This is the most fatal form, and is known as black smallpox.

2. Variola pustulosa hæmorrhagica: in this form hemorrhage does not take place until the vesicular or pustular stage has been reached. Bleeding from mucous membranes commonly also occurs at the same time.

Varioloid is the name given to that form of smallpox which appears in modified guise in the vaccinated. The type differs from the usual form in degree only, being much less severe in the vaccinated, and but seldom attended by any similar mortality. It is well to remember, however, that the unvaccinated may contract the most virulent forms of smallpox from exposure to a case of varioloid.

Complications.—Bronchitis, laryngitis, bronchopneumonia, albuminuria, rarely nephritis, myocarditis, convulsions, delirium, and coma. Frequently boils and carbuncles occur during convalescence. The mortality is from 25 to 35 per cent. and higher. The prognosis is unfavorable in purpura variolosa, and in most cases of

the confluent form where the patient shows hemorrhagic tendencies.

Diagnosis is sometimes doubtful at first, as eruptions resembling those of measles and scarlatina may appear on the second and third days. These rashes, however, are evanescent, and are soon superseded by the characteristic eruption. The mode of onset and especially the symptoms of backache should arouse suspicion if an epidemic be present.

The appearance of papules on the wrists, hands, and forehead which feel like granules of shot beneath the skin is suggestive, and, if followed by umbilicated vesicles, renders the diagnosis certain.

Treatment.—All cases should be removed to a city hospital or a private one devoted to the care of contagious diseases; otherwise the usual hygienic rules should be carried out in regard to the sick-room. Patients should not be kept too warmly covered. At the beginning the pains in the head and back may call for the use of opium or morphine. The diet should be liquid or semi-solid and of a character to be easily digested. Swallowing is sometimes very painful in the confluent forms. Often the vomiting in the early stage is a serious drawback to obtaining the proper amount of nourishment. When the temperature becomes high, cold bathing, sponging, and the cold pack must be employed. The treatment of the eruption is mainly directed towards allaying the itching, preventing crusts from being scattered about, and overcoming the bad odor present in the late stages. A mask for the face may be made of lint and covered with oiled silk, and this lint should be kept moist with carbolic or bichloride solutions. Carbolated vaseline may be used to allay itching. The mouth, throat, and nose should be kept scrupulously clean. During the stage of desiccation frequent warm baths should be administered and carbolic soap used for the purpose

of loosening and softening the crusts. In addition to the above the delirium may call for treatment, as also failing strength and circulation. The danger of contagion is present until all the scabs have disappeared.

VARICELLA (CHICKEN-POX).—An acute contagious disease of childhood, characterized by an eruption of vesicles on the whole body. The cause is unknown. *Symptoms:* After an incubation of from ten to fifteen days the disease is ushered in by a slight chill, or perhaps even by a convulsion, followed by fever, headache, and mild general symptoms. The eruption generally appears in the first twenty-four hours, thus differing from smallpox. It first appears as papules, which rapidly become vesicles, and finally dry up without becoming umbilicated and without having passed through the pustular stage.

Diagnosis is, as a rule, easy. It is sometimes difficult to distinguish from smallpox if the history cannot be obtained and the disease is first seen in late stages when the eruption has begun to dry up and form scabs.

But little *treatment* is usually called for. The main object is to prevent the child from scratching at the eruption on the face and producing permanent scars.

In very rare instances varicella assumes a gangrenous type and may prove fatal.

CEREBROSPINAL FEVER.—An epidemic disease, probably not contagious, due to a diplococcus, and characterized by inflammation of the meninges, and frequently accompanied by a petechial rash. Though generally occurring in epidemics, sporadic cases are frequently met with.

Etiology.—The diplococcus intracellularis or meningococcus is the specific cause. It attacks young people preferably, and is favored by bad hygienic conditions.

There are *several forms* described: (1) common, (2) malignant, (3) anomalous. The common form develops suddenly with chill, headache, and vomiting. Fever rapidly follows, and early there is stiffness of the muscles

Varicella. Stage of efflorescence, third day. (Rotch.)

of the back of the neck. There is photophobia and sensitiveness to noises. As the disease progresses the muscles of the back become involved. There may be convulsions and spasms of the muscles everywhere; the head is drawn back, the eyes squint, and the mind is lost either in stupor or restless delirium. Severe increasing headache is a symptom common to meningitis and one which forms an important point in diagnosis between this affection and typhoid. Herpes or fever blisters are even more common than in pneumonia and malaria. Petechial spots appear in a number of cases, though in some they are absent. The fever is very irregular, and sudden falls of temperature should be regarded as serious. The disease lasts an irregular time, and convalescence is apt to be slow.

Complications.—Pneumonia, pleurisy, and paralysis of extremities or of cranial nerves. Chronic headache may form a troublesome sequela.

The Diagnosis is made by the presence of a continued headache, vomiting, rigidity of muscles of neck and back, by the eye symptoms, and the mental condition, combined with the fact of the presence of an epidemic and the appearance of the petechial rash, and finally by the demonstration of the specific germs in fluid obtained from the spine by lumbar puncture.

The anomalous forms may be divided into the mild, abortive, chronic, intermittent. The mild form presents most of the same symptoms as the common variety, but these symptoms are much less severe. The abortive form is cut short soon after the beginning of what promises to be a rather severe attack. The chronic form presents the very painful picture of exhaustion with severe lasting headache and general neuritic pains all over the body, and either results fatally or causes a protracted invalidism. "Intermittent" is the term applied to the form in which the fever remits or intermits with greater or

less regularity during the attack. The malignant form begins abruptly with all the common symptoms much exaggerated in severity. Death may follow in a very few hours and leave the diagnosis a matter of doubt unless at the time an epidemic be in progress.

Prognosis.—The mortality is always high. It varies greatly according to age, mostly higher in children.

Treatment.—Rest in bed in an absolutely quiet room. Liquid diet; bromides, chloral, and morphia are recommended, the latter being most useful. Ice to the head and spine; blisters over the spine and at the nape of the neck are also of use. In strong patients blood may be taken from the back of the neck by wet cups at the onset. Lumbar puncture may be of some benefit aside from diagnostic purpose. It is most important to maintain quiet about the patient and to see that the bladder is evacuated at regular intervals, as the patient being unconscious cannot speak of his needs. Tubs at a temperature of from 95° to 105° F. every third hour are recommended. The patient should be disturbed as little as possible, and the nurse should plan to bring together the times of giving medicines, sponges, etc., in order to avoid frequent rousing of the patient.

Epidemic Parotitis (Mumps).—A contagious disease characterized by swelling of parotid glands.

Etiology.—Most common in childhood and in early adolescence; males are more frequently attacked than females. The specific contagion has not been found.

Symptoms.—After an incubative stage of two or three weeks, the disease begins with a slight chill and fever of about 101° F. Shortly the child has pain below one or both ears and the parotid gland begins to swell; the swelling extends up in front of the ear, behind it, and frequently pushes the ear forward. The pain is not great, but there is stiffness and tenseness of the cheek on the affected side, which is felt more when eating

attempted. Saliva may be diminished or increased in quantity. Swelling remains about seven to ten days, and then subsides.

Complications.—Orchitis and ovaritis. Delirium and high fever sometimes occur. Meningitis, hemiplegia, and coma are rare. Suppuration of the gland is also rare.

Diagnosis is, as a rule, easy.

Treatment.—Rest in bed, liquid or soft diet; bowels should be freely opened, and fever mixtures given if necessary. Cold or hot compresses may be applied. In case of delirium with high fever an ice-cap should be placed on the head and sponging or tubbing in water at 80° F. be instituted. In the event of suppuration of the parotid, early opening and free drainage are called for.

WHOOPING-COUGH; PERTUSSIS.—A specific contagious disease, characterized by a convulsive cough accompanied by long inspiratory whoops and frequently by vomiting during the paroxysm.

Etiology.—A bacillus has been found with some constancy in sputum. Children are more often attacked than adults.

Morbid Anatomy.—None other than that of bronchitis. Bronchopneumonia, collapse of lung, and enlargement of bronchial and trocheal glands may be discovered in fatal cases.

Symptoms.—Child may suffer from what appears to be an ordinary cough for a week or two before the characteristic whoops appear.

Incubation is from seven to ten days. At first the child has symptoms indicative of a slight cold. There may be injection of the eyes, a little fever, coryza, and some cough, which is hard and dry. After a week or more of this condition the characteristic whoops begin. These are produced by the long inspiration following a succession of quick, short coughs, during which the air in the lungs is being more and more expelled. Often

a little bit of mucus is brought up with the cough, or vomiting may be coincident at times; the sphincters may be relaxed and fæces or urine evacuated. During or just before the whoop the face is congested, lips blue, eyes bulging, and the condition appears very alarming, when suddenly the long inspiration occurs, accompanied by the whoop, which gives immediate relief and restores the child to a period of temporary comfort. Very often an ulcer is found under the tongue and was at one time believed to be a cause of the disease, but is now looked upon rather as an effect. The duration is seldom less than six weeks, and the paroxysms of coughing recur at greater or less frequency, according to the severity of the disease. The complications are serious. Hemorrhage may occur beneath the conjunctiva or into the brain or from the lungs or subcutaneous tissue. Convulsions also may occur. The general exhaustive nature of the disease, coupled with the frequent vomiting during the paroxysms, renders whooping-cough a peculiarly severe disease for weak or anæmic children, and not infrequently they die of exhaustion or tuberculous processes in the lungs.

Prognosis.—Quite a fatal disease in debilitated children; for others the outlook is good.

Treatment.—Generally rest in bed. Isolation should be strict. Of remedies there is no limit, all of more or less use, but few having specific action. Belladonna, quinine, ipecac, paregoric, bromoform, and many others are recommended. After convalescence tonics should be administered.

Diphtheria.—An infectious specific disease characterized by a fibrinous membrane, usually on the throat or in the nose, and by constitutional disturbance, due to toxins formed at the seat of infection. Diphtheria is due to the action of the Klebs-Loeffler bacillus, and a diagnosis is incomplete without the demonstration of

its presence. Many forms of sore throat resemble diphtheria so closely that they are impossible to differentiate without the bacteriological examination. Conversely, many apparently simple sore throats are found to be true diphtheria.

Etiology.—Klebs-Loeffler bacillus. The disease is more common in the late fall. It attacks adults as well as children, though more common in the latter. One attack does not protect against others; rather the contrary. The bacilli are very resistant and will live months in rooms and in bed-clothes, etc. Diphtheria is particularly dangerous to doctors and nurses owing to the necessity of looking down the throat and applying local treatment, thus incurring the danger of being coughed upon.

Diphtheria and scarlet fever may occur together.

Pathological Anatomy.—Membrane is found on tonsils, soft palate, uvula, larynx, pharynx, trachea, bronchi; rarely in the vagina and stomach.

In fatal cases it is often found in the larynx and bronchi. The heart may be fatty and the kidneys show signs of inflammation. Bronchopneumonia is also commonly present as a complication in severe cases where the larynx is the seat of the membrane.

Symptoms.—After an incubation stage of from two to seven days the onset begins like that of most infectious diseases with exception of the sore throat being a pronounced symptom. Temperature rises to 102° or 103°. At first the throat is red and is exceedingly sore. In a day or two the membrane develops over the tonsils and uvula and may spread to the pharynx. This membrane is white or grayish-white at first, is adherent to the mucous membrane, and leaves a bleeding surface when removed. Later the color changes to a dirty gray. In a simple case this membrane persists for several days, and frequently disappears with great rapidity. Rarely

is the membrane present later than the tenth day. This description is of an ordinary uncomplicated case. When the membrane extends to the larynx, the signs of obstruction to breathing are present. The face becomes anxious, the eyes staring, inspiration is long and accompanied by a noise which is difficult to describe and equally so to forget when once heard. At the same time the soft parts above and below the thorax are retracted at each inspiration. The child, when in this condition, rarely cries out or moves about, as it understands that all its energies must be saved for the act of breathing. The accessory muscles of respiration are seen to be acting and the lips become blue, though this latter symptom occurs only when asphyxiation is imminent.

The glands of the neck are enlarged and there is weakness which often bears little or no relation to the size or gravity of the local affection.

Laryngeal diphtheria may occur without involvement of the tonsils or pharynx, and no membrane may be visible.

Complications and Sequelæ.—Hemorrhage from ulcerated surfaces. Renal disease. Most important sequel is paralysis of the nerves; sometimes general, usually local. The most frequent seat of paralysis is in the soft palate, where the symptoms of regurgitating liquid through the nose and a nasal tone to the voice make the diagnosis. A certain number of cases die from heart failure coming on suddenly, generally during convalescence (second week or as late as sixth and seventh). A slow pulse is more to be feared than a rapid one. The majority of these heart failures are due to involvement of the cardiac nerves, though some are also due to inflammation and degeneration of the heart muscle.

Diagnosis is often difficult, as diphtheritic and non-diphtheritic sore throats may present precisely the same appearance, and the diagnosis rests on the bacterio-

logical examination. It is a good rule to keep isolated from other children one that has a sore throat of any description.

Prognosis.—Mortality was formerly quoted as from 30 to 50 per cent. Since the introduction of antitoxin it has fallen much lower, being but 12 per cent. in Boston in a large number of reported cases.

Treatment is directed locally toward the throat, and generally, to support strength and neutralize toxins. The patient should be strictly isolated; carpets, curtains, etc., should be removed from the sick-room. The air of the room should be kept a little moist by means of a kettle, and linen dusters should be provided for physicians to protect their clothing from becoming infected.

The local treatment of the throat is important, but often so difficult to carry out in children that the gain is more than counterbalanced by the ill effects of a struggle, and hence must sometimes be abandoned.

Of drugs that may be used locally, the ones that seem best are Loeffler's solution applied with a swab; bichloride of mercury, 1:1000, in the same way; 3 per cent. carbolic acid in 30 per cent. alcohol; hydrogen peroxide; boric acid, and others. If the nose be involved, sprays of hydrogen peroxide or Dobell's solution may be used, and the nose swabbed with Loeffler's solution or dilute carbolic acid. When the larynx is involved, the child should be kept in an atmosphere saturated with steam, and, should the breathing become very difficult and the lips blue, tracheotomy or intubation should be performed. Diet should be nourishing and liquid.

Tincture of chloride of iron and bichloride of mercury in combination are commonly given. Quinine also is useful.

Antitoxin should be administered early in doses of from one thousand to three thousand units, and repeated

frequently if necessary. In severe cases I have used three thousand units every six hours for several days with great benefit.

INFLUENZA, OR GRIPPE.—A protean disease appearing in world-wide epidemics, characterized by inflammation of the mucous membranes and generally with bone pains in legs and back.

Etiology.—Influenza occurs in great epidemics, and is due to the bacillus discovered by Pfeiffer.

Incubation is from one to four days.

Symptoms.—The onset is abrupt, with perhaps a chill, fever, pain in the back, and headache.

There are several distinct *forms* of influenza:

1. The respiratory, in which the symptoms are limited to the mucous membranes of that tract. There may be sore throat, severe bronchitis, and with high fever. Either bronchopneumonia or the croupous type of pneumonia or pleurisy may be present.

2. Nervous form: without the clinical picture of effects of catching cold; there may be severe headache, prostration, great pains in back and limbs, and many peculiar nervous manifestations.

3. There may be general gastro-intestinal disturbance.

4. Febrile form: there may be no manifestations of catarrhal conditions, but simply continued fever closely simulating typhoid.

Influenza has many *complications and sequelæ*,—pneumonia, tuberculosis, chronic bronchitis, delirium, melancholia, rapid heart action, and neuritis; ear diseases are common.

Diagnosis is easy when an epidemic is in progress. Sporadic cases are more difficult of diagnosis.

The existence of prostration of strength and spirits out of proportion to the fever is significant, when taken in conjunction with the symptoms.

Treatment.—Isolation. Rest in bed is of great im-

portance, in order to avoid the complications due to taking additional cold. The secretions from the nose should be received on pieces of gauze and burned. The sputum should be disinfected. At the onset a purge should be administered, and calomel is the one most frequently employed. A hot bath is often of use at the beginning to relieve back and leg pains. Phenacetine and antipyrin may be given to reduce the temperature as well as to relieve headache and backache, and strychnia and whiskey as stimulants in case of heart weakness, so common in influenza. Cough may be combated with expectorants, such as ammonium chloride, ipecac, morphia in small doses, or codeine. Other symptoms are treated as they arise. If the throat be very sore, gargles may be used, such as potassium chlorate in saturated solution, listerine diluted one-fourth, or the throat may be painted with silver nitrate solution.

Salol, salicylate of soda, salicylate of cinchonidia, and quinine are all given for lessening temperature, relieving pain, and shortening the course of the disease. Should pneumonia develop, the treatment is directed entirely towards the more serious new condition.

In a large number of cases there is physical and mental weakness, persisting for some time after influenza. Not infrequently suicides are the direct result of this depression, and therefore great care should be given to the convalescent period.

Erysipelas.—An acute contagious disease characterized by inflammation of the skin, caused by the streptococcus erysipelatosis.

Etiology.—Pregnant women and patients after operations are specially liable to attacks. It occurs most commonly in the spring. Generally there is an abrasion of the skin at the point of beginning.

Morbid Anatomy.—That of inflammation of the skin. This inflammation in severe cases may go on to suppu-

ration. Meningitis may follow erysipelas of the scalp. Endocarditis, nephritis, pyæmia, and meningitis are all not uncommon complications.

Symptoms.—Incubation, three to seven days, as nearly as can be judged. Onset has characteristics of most infectious diseases. Redness appears, usually at the angle or bridge of the nose and spreads over both cheeks, and in twenty-four to forty-eight hours the whole face is involved, the eyes completely closed, lips swollen, and blebs formed superficially. The fever is generally very high, and in weak, debilitated people the constitutional depression may be very great and delirium present. In about one week the temperature descends by crisis, the swelling and œdema abate, and desquamation ensues.

Ambulatory type: Sometimes as the erysipelatous inflammation moderates in one area it appears and spreads in another. Thus a facial erysipelas may spread to the back of the neck and thence over the whole back. This type is more serious because of the area involved and the lengthening of the course of the disease. In some cases suppuration of the skin and subcutaneous tissue takes place.

Complications.—Meningitis, endocarditis, nephritis, and septicæmia.

The diagnosis is made by the appearance of the skin and the infective onset.

The prognosis is good except in the aged, in drunkards, and in new-born children when it occurs about the navel.

Treatment.—Erysipelas should be isolated from surgical cases, but not necessarily from medical ones. Nurses and physicians should not attend erysipelas and confinement cases at the same time. Laxatives at the onset. Tincture of chloride of iron and quinine, pilocarpine, and hypodermics of bichloride of mercury are

DATE	RESP.	PULSE	DAY OF DIS.	97	98
2	28	120			
	30	120			
	30	116		CHILL	
	36	134		AFTER	
	36	120			
	36	112			
	32	112			
	34	120			
3	30	116			
	32	126			
	28	108			
	34	124		CHILL	
	30	128		AFTER	
	28	120			
	32	108			
	32	120			
4	30	118			
	32	122			
	36	112			
	36	120		CHILLY SE	
	32	100			
	32	114			
5	32	120			
	32	118			
	36	128		CHILLY SE	
	40	132		AFTER	
	36	132			
	30	96			
	30	102			
	36	130		CHILLY SE	
	36	128			
	40	126			
6	32	112			
	36	116			
	34	136			
	36	140		CHILLY SE	
	36	133			
	36	128			
	34	120			
	34	128		CHILLY SE	
7	36	126			
	32	116			

97 9

all useful. Locally, ichthyol, 30 to 50 per cent., in vaseline, or bichloride dressings, may be applied, and stimulants given if necessary. Great care of the hands should be taken to prevent infection of the nurse herself or of other patients.

TOXÆMIA, SEPTICÆMIA, AND PYÆMIA.—These are affections due to the absorption of bacterial toxins and bacteria themselves.

Certain diseases, such as diphtheria, tetanus, pneumonia, and others, are accompanied by a toxic condition produced by the toxins generated by bacteria at the site of the local lesion. This is a true toxæmia.

Septicæmia is due to the entrance of bacteria into the blood and tissues, and differs from pyæmia in that no abscesses occur in the former but are present in the latter.

We see septicæmia commonly following neglect after child-birth, also from infected wounds. It begins with a chill followed by fever. If a finger be the point of infection, red lines will be seen running up the arm and the lymphatics at the elbow and axilla will be enlarged. In severe cases there may be delirium, capillary hemorrhage, stupor with dark-coated tongue, and finally death.

If caused by streptococci the prognosis is bad.

General septicæmia may exist without evidence of local infection.

Pyæmia is said to exist when the bacteria which have entered the blood and tissues form abscesses. This condition may be produced by various kinds of bacteria. In most cases some local seat of infection exists or is known to exist before the general symptoms come on. These metastatic abscesses occur frequently in the lungs when the local infection is on the surface (as, for example, an external wound). They occur in the liver, particularly when the intestines are the seat of the local

infection or other parts of the portal circulation are involved.

Treatment.—Surgical whenever possible. Otherwise, quinine, arsenic, or tincture of the chloride of iron may be given. Whiskey and strychnine to keep up strength. Antistreptococcus serum may be used, but the results are not very satisfactory nor to be at all compared with those of the antidiphtheritic treatment.

RHEUMATISM.—An acute fever characterized by inflammation of the joints and fibrous tissues. It is not contagious and is not positively proved to be infectious. One attack predisposes to others.

Etiology.—As yet no specific organism has been definitely proved to be the cause. Rheumatism is more common in late winter and early spring and primary attacks commonly occur between the ages of fifteen and thirty. Certain exposing occupations predispose to it. Men are more commonly attacked than women, and the incidence is greater in the temperate than in other zones.

Pathology.—There are no characteristic post-mortem changes. There may be swelling and hyperæmia of the joint membranes and about the ligaments and tendon sheaths. There also may be some slight erosion of the cartilage. Rarely, if ever, is there pus present.

Symptoms.—The onset is abrupt with chilliness, elevation of temperature, and swelling of one or more joints. Very commonly, sore throat precedes the joint symptoms. The temperature ranges between 102°–104°, and several joints become swollen, red, and exceedingly painful. Acid sweats are commonest at this stage, and the symptoms are usually associated with fever. Scanty urine, coated tongue, constipation, and weakness are present. Knees, ankles, elbows, and wrists are the joints most commonly affected. The duration of the disease is very variable, and fever subsides by defervescence. There is decided and rapid anæmia. In

favorable cases the disease slowly comes to an end and the joints regain their normal condition. In others the condition persists in a subacute or chronic form and most obstinately resists treatment. There is, in addition, a form of subacute rheumatism which begins with less severity than the acute, with involvement of fewer joints, less fever, and less pain.

Complications.—(1) Hyperpyrexia, (2) endocarditis, pericarditis, myocarditis, and pleurisy.

Diagnosis is readily made by the study of the onset, and by the involvement of several joints with accompaniment of fever and acid sweats, preceded in some cases by sore throat.

Treatment.—General hygienic condition of sick-room. The patient should sleep between blankets. A flannel night-gown slit down the middle and through the arms should be worn. Locally, lead-water and laudanum, ichthyol, belladonna and mercury, and chloroform liniment, may be applied. Splints sometimes give great relief. Internally, sodium salicylate, salicylic acid, salicin, and oil of wintergreen should be administered. Alkalies may be given. Potassium bicarbonate, one drachm third hour; acetate of potash, sodii bicarbonate, etc.; morphia to relieve pain. Potassium iodide, sodium iodide, and syrup of iodide of iron, are given for the more chronic forms.

Dysentery.—An acute inflammation of large intestine characterized by diarrhœa, tenesmus, and small bloody stools.

Etiology.—Dysentery occurs in hot weather, and is more prevalent at times of abrupt changes in temperature. Tropical dysentery and much of the dysentery in our own latitude is due to a small animal parasite, the amœba coli.

Pathological Anatomy.—Congestion and swelling of mucous membrane of large intestine; sometimes ulcera-

tion. In that variety due to the amœba, abscess of the liver is apt to be present.

Symptoms.—Begins gradually with symptoms of diarrhœa. Later, in course of two or three days, there is fever; pain in the abdomen, frequent stools, at first fecal and later consisting of mucus and blood; fever and general prostration. This condition may last a week or more, and is followed by slow convalescence. In the severe forms—amœbic and croupous—these symptoms are all intensified, and death frequently results from exhaustion.

Diagnosis is made by the existence of diarrhœa accompanied by evacuation of bloody, mucous stools with great tenesmus. The finding of amœbæ is, of course, diagnostic.

Prognosis is, as a rule, good in this climate among healthy adults. In the tropics the mortality is very high, especially among soldiers.

Treatment.—It may be checked at onset by care. Rest in bed; liquid diet; saline purge is commonly given at the onset. Ipecac and laudanum, morphia, calomel, and bismuth are the drugs most popularly employed. Locally, injections of astringents, such as nitrate of silver, quinine, acetate of lead, sulphate of zinc, and others are of value.

The stools should be disinfected, as also should sheets, night-gown, and bed, and other linen used in the course of the disease.

MALARIA.—An infectious disease, characterized by fever, chills, and sweats, caused by an animal parasite in the blood. These parasites are injected by mosquitoes, and so far as we know can obtain access to the blood in no other way.

Etiology.—The plasmodium malariæ is proved to be the cause. Three distinct varieties of the plasmodium have been shown to be associated with the three dis-

DATE	RESP.	PULSE	DAY OF DIS.
7/24	30	108	
	28	100	
23	28	96	
	28	80	
	26	60	
	24	64	
	26	64	
	25	72	
24	26	76	
	26	76	
	24	68	
	24	76	
	32	108	
	28	84	
25	24	72	
	24	80	
	24	54	
	24	64	
	24	68	
26	24	70	
	24	80	
	28	92	
	28	96	
27	28	98	
	28	92	
	24	64	
	24	68	
	24	68	
28	24	70	
	24	84	
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	28	84	
	28	88	
29	28	80	
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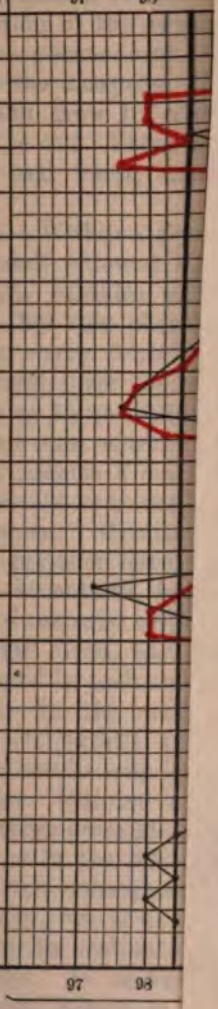
	28	84	
29	28	80	
	24	68	
31	24	60	
	24	68	
8/1	24	70	



tinct forms of malaria,—tertian fever, quartan fever, and æstivo-autumnal fever.

The evolution of the symptoms depends on the cycle of life of the plasmodium within the blood. After inoculation by the mosquito the parasites enter red blood-corpuscles and grow by devouring the hæmoglobin or pigment of the cell. They then are grouped into rosette-like shapes and burst, causing the chill, fever, and sweat.

Symptoms.—Within a few days after infection, a patient has a chill followed by fever lasting a few hours, which in turn subsides with sweating. Subsequently every other day this phenomenon will be repeated in tertian fever, every fourth day in quartan fever. In æstivo-autumnal fever the whole course may be irregular. There may be no chills or sweats and the fever may be continuous and similar to that in typhoid fever. Malaria may assume a malignant form. The spleen is enlarged, anæmia very rapidly develops, and constipation is common. Certain symptoms which have a paroxysmal character have proved to be manifestations of malaria,—hæmaturia, headache, etc. (but should not be assumed of malarial origin without the finding of the parasite in the blood, nor should quinine be administered haphazard in such cases).

Treatment.—In the cold stage blankets should be placed over the patient and hot drinks administered. The hot stage rarely lasts long enough to demand a cold bath or sponge. Quinine is the best remedy. It should be given in large doses shortly before a chill is due, so that it may be in the blood when the parasites sporulate and prevent subsequent chills. Methylene blue is given internally, but is not so effective as quinine. In severe cases, or in obstinate ones, quinine may be given hypodermically. In malignant cases this method of treatment should always be adopted.

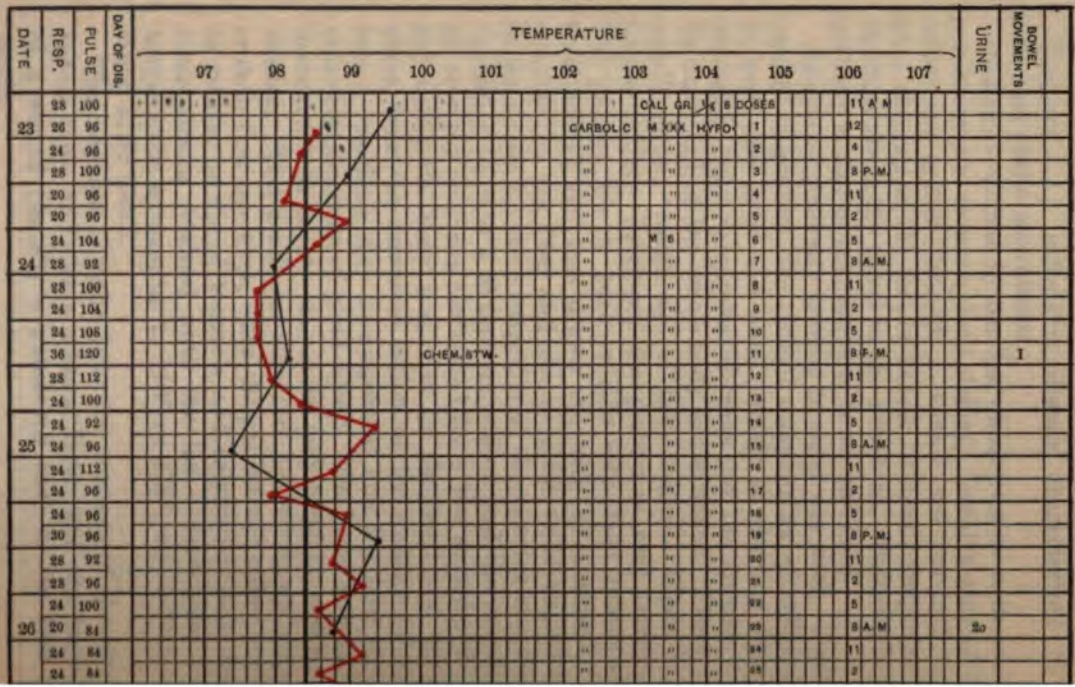
TETANUS.—An infectious disease characterized by tonic and clonic convulsions.

Etiology.—Caused by bacillus which lives in earth, and particularly in manure about stables. Bacillus generally enters the system through a wound and particularly when situated in the feet or hands. Tetanus frequently develops about the navel in the new-born. Pathological anatomy is that of congestion of brain and cord.

Symptoms generally develop in about one week. Onset usually is gradual, the patient complaining of stiffness in neck and jaws and some trouble in chewing food. Gradually these symptoms increase and the muscles of the back and of the whole body are involved. There is usually fever, though not of high degree. When the disease is fully developed the picture is very terrible. The patient lies on back or side with head retracted, back arched and legs drawn up, with an anxious expression on the face and the peculiar smile imparted to the mouth by the contraction of the risorius muscles. Suddenly there is a violent convulsion and the muscles all over the body are contracted for a few seconds, during which the body may rest on the head and heels alone from the powerful action of the muscles of the back; breathing may be suspended and the face show unmistakable signs of great agony. The body is usually drenched with sweat. Any noise may bring on this convulsion. This condition may last but thirty-six hours or more than one week, when the patient will either begin to recover or die of toxæmia and exhaustion with full consciousness retained until the last. Sometimes the temperature springs up to 110° or 112°, and continues rising after death.

The *diagnosis* is made from the presence of the alternating tonic and clonic spasms, fever, and the history of a wound (usually a punctured one) in the feet or hands.

TETANUS


TEMPERATURE
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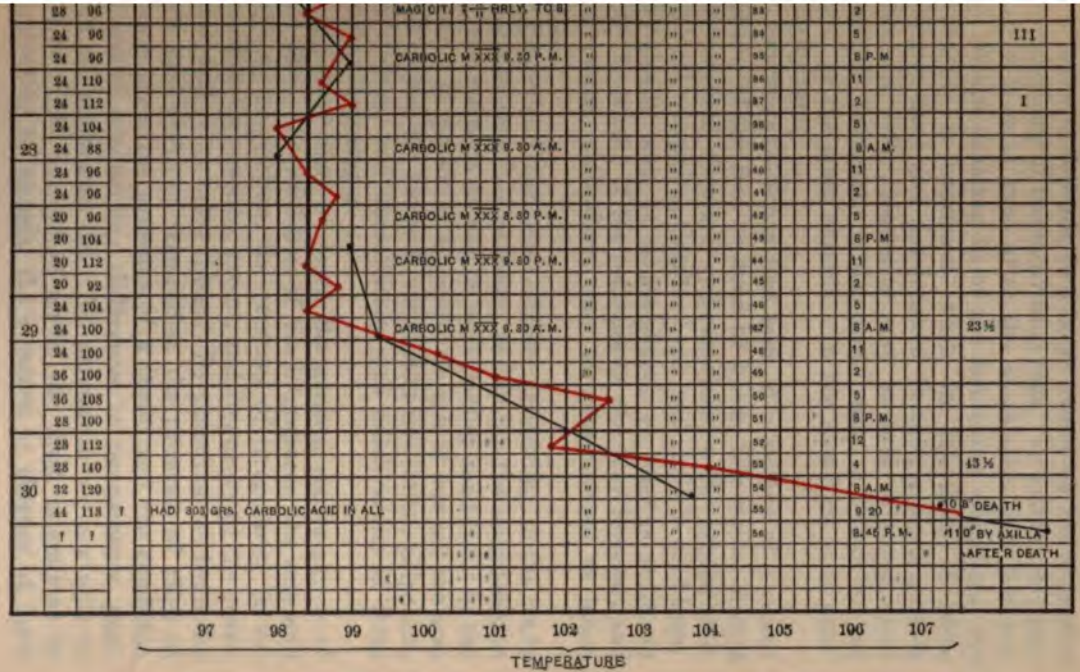


Chart of a case of tetanus, illustrating the rise of temperature preceding and following after death.

Prognosis depends to a large extent on the acuteness or chronicity of the individual case. In tetanus developing in a short time after the inoculation and followed by abrupt ushering in of the convulsive symptoms, the mortality is enormous, while in the cases of more chronic onset and development there is a much greater hope for life. Mortality may be said to range from over 90 per cent. in the acute cases to about 50 per cent. in the more chronic. In the new-born it is practically fatal.

Treatment.—When first seen, if a history of a recent wound of the foot or hand be given, this wound should be reopened, curetted, and cauterized with carbolic acid. Chloral, morphine, Calabar bean, and carbolic acid hypodermically may be administered, or tetanus antitoxin may be tried. If the convulsions are very frequent and exhausting, chloroform may be administered at intervals.

Physical Diagnosis.—Before proceeding to the study of pneumonia it is necessary to take up the consideration of the methods of use in interpreting conditions in the chest. In physicial diagnosis we call to our aid the special senses, the methods used being inspection, palpation, percussion, and auscultation, and subdivisions of these of less importance.

By inspection we learn the general conformation of the chest, the condition of the interspaces, the rate and type of respiration, the presence of irregularity in expansion, the position, extent, and frequency of the heart-beat, and many other things. By palpation we learn the rate and depth of respiration, the presence of râles of coarse type, the presence of a thrill, and the condition of sound conduction; differences in temperature, position of heart-beat, etc. By percussion we are able to judge of the amount of air in the chest, alterations in conduction of sounds, the presence or absence of fluid

and air in the chest cavity. By auscultation we determine the depth, quantity, and quality of respiration, the presence of adventitious sounds, the condition of sound conduction, the locality and condition of the heart, and the state of its valves.

Inspection.—In conditions of the lung in which there is consolidation (as in pneumonia or phthisis), or, in other words, when less air is able to enter the chest, there will be less expansion of the lungs, or of one lung if the condition be unilateral. This diminution of expansion, especially when unilateral, is evident to a trained eye, and may even be recognized when both lungs are equally involved.

When fluid is present in the chest, inspection will show diminished expansion and bulging interspaces. In addition it will show any displacement of the apex-beat of the heart.

Palpation will, in a measure, determine the amount of expansion, will show an increase in the conduction of the spoken voice in cases where the lungs are consolidated, and a lessening in cases where fluid is interposed, as in pleurisy. It will also show difference in temperature, as in cases of purulent pleurisy, and the presence of a thrill as present in some cardiac conditions and also sometimes in pleurisy.

Coarse râles may also be detected by palpation in cases of asthma and bronchitis.

Percussion.—In cases of consolidation of the lung, as in pneumonia or phthisis, on percussion a dull note is elicited. In pleurisy with effusion the percussion note is flat, while over cavities in the lungs a peculiar sound, which has been likened to the sound produced by striking a cracked pot, is often produced by percussion.

Auscultation shows in consolidations bronchial or tubular breathing, the presence of râles in pneumonia, bronchitis, asthma, and œdema of lungs, and the exist-

ence of cavernous breathing over lung cavities, a sound which has been likened to that produced by blowing into the neck of a flask. It will also reveal pleuritic or cardiac friction sounds, murmurs in valvular heart disease, and weakness of heart muscle.

PNEUMONIA.—An acute infectious disease characterized by inflammation of the lungs, fever, and a sharply outlined course which ends abruptly by crisis. The cause is an organism known from its discoverer as the diplococcus of Fraenkel.

Etiology.—At present it is the greatest and most fatal scourge the world over. Males are attacked more frequently than females. In colored people the disease is more frequently fatal than in the white. Pneumonia is especially fatal in alcoholic subjects, and alcohol also is a predisposing cause. Pneumonia may occur rarely from contusions of the chest wall. Taking cold predisposes to pneumonia, though it must be clearly understood that the disease process is caused by a germ and not by the cold. Pneumonia is much more prevalent in certain seasons of the year than in others, and particularly so in the last month of winter and beginning of spring. This is due to the great variation of temperature and the sudden changes of those periods. Pneumonia exists in hot climates with equal frequency as in cold. In the extreme cold of the Arctic regions this disease is practically unknown.

The proofs of infection are several. In the first place, the disease is known to be caused by a specific microorganism; secondly, the disease has been acquired by those handling cultures of the germ, and finally the appearance of epidemics in institutions and schools, very strongly suggests that the disease is both infectious and even slightly contagious. Recurrence is very apt to take place, sometimes very shortly after the attack; at others at longer intervals. I have treated two patients who

annually developed pneumonia for three successive years.

Morbid Anatomy.—There are three stages,—(1) exudation, (2) red hepatization, (3) gray hepatization or resolution.

In the first stage there is an outpouring of fibrin and corpuscles into the air-vesicles of the affected part of the lung, which is rapidly followed by the second stage, namely, the coagulation of this fibrinous exudate, with the resulting condition known as consolidation of the lung. As a matter of fact, the condition is really one of consolidation of the exudate, but in effect the difference is merely one of definition. During this stage the consolidated area is red or liver-like in color, and from this appearance the name hepatization was bestowed. In the third stage the color changes from red to gray, the cellular elements undergo fatty degeneration, while the albuminous exudate is absorbed or expectorated, and thus the lung cells return to normal conditions.

In some cases the exudation, instead of going through stages of fatty degeneration, liquefaction, and absorption, becomes purulent, and this extending to the lung tissues produces abscess of the lung. Another ending of pneumonia is gangrene of the lung, which may result from pressure of the consolidation on the blood-supply. More commonly, however, it is due to inability of the lung tissue to recover from the inflammation, and the local death follows.

Pneumonia may exist in one or both lungs. It generally also involves the pleura to some extent. The severity of the constitutional symptoms are frequently out of all proportion to the amount of consolidation. The first stage lasts from one to three days, the second from three to seven days, and the third from one to three weeks.

Symptoms.—The incubation stage is hard to estimate. The disease begins abruptly with a severe chill followed

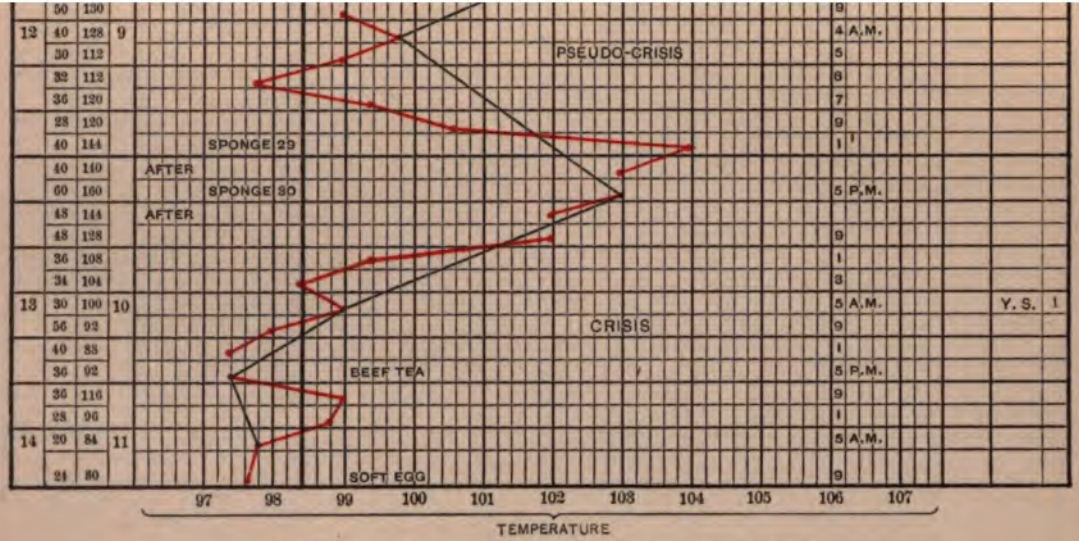


Chart of a case of pneumonia, illustrating crisis and pseudo-crisis.

immediately by fever and cough, pain in the chest, and rapid respirations. When the disease is developed the patient lies on the affected side; the cheek on that side is flushed, the respirations are hurried, and there is frequent, hard, painful cough. Herpes is common on the lips or nose. The lips are sometimes blue. The temperature is high, and the pulse is rapid and full. In old persons the temperature is lower, and sometimes there is no fever whatever.

The crisis of pneumonia occurs about the seventh to the ninth day. All the symptoms suddenly abate with the fall of the temperature, and, though the consolidation may remain and the physical signs be unchanged, the patient is comfortable and frequently falls into a sleep. In a certain number of cases the termination may be by lysis.

The pain in pneumonia is due to involvement of the pleura. Dyspnœa is commonly present. Respiration may be from 30 to 50, or in children from 80 to 100. Cough is at first dry and hard; later looser with expectoration; at first blood-streaked and later rusty, thick, and tenacious. Sometimes there is expectoration of fresh blood at the onset. In children there may be no expectoration whatever. After crisis, when gray hepatization and resolution are going on, expectoration is generally more free and contains the diplococcus.

Physical Signs.—On inspection the respirations are seen to be hurried and often shallow, and there may be noted some lack of expansion of the affected side, particularly in the later stages. The earliest positive sign of pneumonia is the presence of the so-called crepitant râle which is caused by the separation of the agglutinated air vesicles during inspiration. Later when consolidation is present there is dulness on percussion, tubular or bronchial breathing on auscultation, and increase of vocal resonance and fremitus.

Treatment.—Expectorants of various kinds are given with a view of promoting softening and getting rid of the exudate. Ammonium carbonate, ammonium chloride, aromatic spirit of ammonia, guaiacol carbonate, creosote carbonate, and many others are popularly given. Hypodermics of quinine are of undoubted value, and in many cases salt solution by hypodermoclysis gives excellent results. Stimulants, such as strychnia, whiskey, digitalis, may be given when necessary. Local applications are sometimes of use to allay pain. The hot jacket poultice or hot stupes often ease the pleuritic pain in children. In making these applications, however, care should be exercised not to apply them so tightly as in any way to affect the function of respiration. Sputum should be received in pasteboard cups, which may be burned, or in japanned tin or china cups which contain carbolic acid.

Cerebral conditions often obscure diagnosis. In children a convulsion may take the place of the initial chill and be followed by a condition readily mistaken for meningitis if the lungs be overlooked in examination.

Complications.—Pleurisy, pericarditis and endocarditis, and meningitis are among the most common. Relapse and recurrence take place in a number of cases.

Clinical Varieties.—According to location, apex, base, or central. May be secondary, as following or occurring in the course of diphtheria, measles, typhoid, etc.

Terminal.—As the ending of chronic conditions, like diabetes, chronic bronchitis, or tuberculosis. Pneumonia may follow the administration of ether.

Prognosis.—Pneumonia is a very fatal disease. The mortality varies greatly, from 20 to 40 per cent. Many things modify prognosis, as, for instance, age, sex, race, and alcoholism.

Treatment.—Rest and quiet are essential. The diet should be liquid. A light flannel night-gown is desirable, with opening in front to make examination of chest

easier. A daily sponge-bath in tepid water should be given. Treatment is directed towards sustaining the strength and controlling the temperature.

TUBERCULOSIS is an infectious disease due to the tubercle bacillus and characterized by the formation of tubercles which undergo softening, caseation, and ulceration. Tuberculosis may affect any tissue of the body, though at certain ages it seems to have a selective tendency, preferring to attack particular tissues. Thus, in infancy the meninges are frequently the seat, in childhood the hip-joint, vertebræ, and cervical glands, while in young adult life the lungs are most vulnerable. In the different situations tuberculosis has been given different names before its identity in all was established. Tuberculosis of the skin is spoken of as lupus; of the hip-joint as hip-joint disease; of the lungs as consumption or phthisis.

Etiology.—The active cause of the disease is the tubercle bacillus. The disease is rarely hereditary, though the predisposition to it is commonly so. Certain occupations conduce to its development, notably those compelling confinement to badly ventilated and lighted rooms, and those which are associated with a dusty atmosphere, particularly if the dust be stone-dust, as in stone-cutting. Chronic coughs and colds may be regarded as predisposing causes.

The infection of tuberculosis takes place either through inhalation or ingestion of air or food containing bacilli. In order to make it possible for the bacilli to float in the air it is necessary that the sputum or dejecta containing the bacilli should become dry. As long as contaminated discharges remain moist the bacilli are stationary. The consumptive is only a source of danger as long as he is careless of the safety of others.

Tuberculosis of the lungs occurs in *four varieties*,—namely, acute miliary tuberculosis, acute pneumonic

phthisis, chronic ulcerative phthisis, and fibroid phthisis.

Acute miliary tuberculosis occurs in the lungs as part of a general tubercular infection. The symptoms are sometimes entirely suggestive of a lung disease, at other times the disease is scarcely to be distinguished from typhoid fever, while a third type attacks the cerebral meninges particularly, though sometimes the spinal also.

In the pulmonary type the condition is like that of a marked bronchitis, associated in many cases with a tubercular consolidation of the lungs. The patient is very short of breath, cyanosed, has fever, and sweats freely, cough is frequent, and expectoration mucopurulent. The course is rapidly fatal. The diagnosis is made by the knowledge of a pre-existing tubercular lesion, the discovery of the tubercle bacillus in the sputum, by the physical signs, and the rapidly downward course. Treatment is of little avail. The patient should be given tonics, mild expectorants, and morphia if the cough gives much pain.

The typhoid-like form begins and develops like typhoid fever, and often cannot be distinguished from it until late in the affection, when a meningitis may occur, and suggest its tubercular nature. As in typhoid the pulse is slow in relation to the temperature, so in tuberculosis the pulse commonly maintains the usual ratio. The course is generally from four to eight weeks in duration, and is invariably fatal. The treatment is the same as in the pulmonary type.

The meningeal type usually occurs in children, and may have an abrupt onset, with intense pain in the head, photophobia, and nervousness, followed by vomiting, often projectile in character, and by fever. The patient may become delirious and give the short, sharp outcry so characteristic of brain affections in children. As the disease progresses the abdomen becomes scaphoid, the body emaciated, the head retracted, the pupils altered;

convulsions and coma develop, and death ensues. The course may be about two weeks or more in length. Usually preceding the attack the child is noticed to be in poor health.

Pathological findings consist in inflammation of the meninges at the base of the brain and the presence of small miliary tubercles on the blood-vessels in the same locality. Treatment is directed towards making the child more comfortable. Ice should be applied to the head and continued if it seems to give ease. Hot baths with mustard may be given to control convulsions. Bromides and chloral to quiet the delirium and give sleep. The prognosis is hopeless.

Acute pneumonic phthisis begins as an ordinary case of pneumonia, and its true nature may be only suspected when resolution does not take place at the expected time or when cavities begin to form. This form lasts generally from a few weeks to several months, and is a very fatal type. Fortunately, however, it is rare.

Chronic ulcerative phthisis is the most common form. It usually attacks the apex of the lung, at first producing consolidation, to be soon followed by softening and cavity formation. The disease begins gradually, as a rule, and nothing may be complained of except a slight cough and indigestion. Soon the patient begins to loose flesh, the cough increases, expectoration becomes mucopurulent, there are daily rises in temperature, and night-sweats occur. In the later stage, or that of the cavity formation, the sweats are drenching, and hemorrhages may occur; there is extreme emaciation, and the patient may be no longer able to walk about. The fever is then of a hectic type. Often there is secondary involvement of the pleura, intestines, and larynx. The patient's condition is inexpressibly wretched, and yet he often clings to life with a hope that is pathetic. The course may last from a few months to several years. The physical signs

of the early stage are those of consolidation, while later signs of cavity may be elicited. The diagnosis is confirmed by the finding of the tubercle bacillus in the sputum.

Fibroid phthisis is a condition in which, in addition to a local tubercular lesion in the lung, the connective tissue of the whole lung or part of it undergoes hyperplasia. The result is that the affected lung is shrunken and retracted, the heart is often displaced, and the percussion resonance is generally diminished, as is also vocal fremitus and resonance. The disease is the most chronic of all forms of phthisis, frequently lasting more than ten years.

Early discovery and treatment of consumption frequently meet with gratifying success, particularly in the cases of those suffering from the more chronic forms of the disease. By those who are able, a high, dry altitude should be sought, where an open-air life should be persisted in without regard to temperature. Rainy and damp days form exceptions, and in such weather a consumptive should not venture out of doors. In the event of the patient not being able to remove to the chosen climate, he should endeavor to live the same kind of open-air life at home with a fair hope of success. We should do all in our power to encourage those suffering from consumption and to prevent their regarding themselves as hopeless. Fortunately, nature has endowed this disease with an alleviating hopefulness and cheerfulness which often remains until death, and is spoken of as "spes phthisica"—the phthisical hope. Next to the importance of the out-door life is the necessity of a generous diet of digestible food. In those whose digestion is not strong this food-supply may have to be limited to milk and eggs, but these should be ordered freely. Medicinally, cod-liver oil and creosote as a tonic and expectorant and morphia and atropia for the cough and sweats

are most valuable. In regard to the prophylaxis, it must be clearly understood that if the tubercular sputum be disinfected before being allowed to dry there is comparatively little danger of infection from the case. Sleeping in the same bed with a consumptive would, of course, be dangerous, as the bacilli may be present in coughed-up vapor. The sputum should be received in china, glazed earthenware, japanned tin, or pasteboard cups, the latter being preferable, as they may be burned. In these cups 1 : 20 carbolic acid solution should be kept, and the sputum should never be allowed to dry.

A tubercular woman should never nurse her child. A child born of tubercular parents should be brought up to lead a healthy out-door life; should be given tonics if run down, and great care should be taken of all colds contracted. Should these colds be frequent, severe, and hard to get rid of when acquired, it is better in that case for the patient to move to Colorado or California.

CHAPTER X

Constitutional Diseases: Arthritis Deformans, Chronic Rheumatism, Muscular Rheumatism, Gout, Diabetes—Diseases of the Digestive System: Gastritis, Gastric Ulcer, Peritonitis, Appendicitis, Gall-Stones, Cirrhosis of the Liver—Diseases of the Blood and Ductless Glands: Anæmia, Chlorosis, Progressive Pernicious Anæmia, Exophthalmic Goitre.

CONSTITUTIONAL DISEASES

ARTHRITIS DEFORMANS, or rheumatoid arthritis, is often confused with chronic rheumatism. It is a disease of unknown origin, characterized by changes and deformities in the joints.

Etiology.—It occurs between the ages of thirty and fifty, the female sex being more often attacked. Exposure and mental worry are factors in its production. The nervous theory is that the lesions of rheumatoid arthritis are due to some spinal affection and are to be compared to the arthropathies which sometimes occur in spinal diseases. The difficulty in the way of accepting this theory is that these supposed causative affections of the spinal cord have never been demonstrated, and until such proof is furnished this etiology cannot be regarded as established. No specific infection has ever been connected with this disease, though the theory of its infectious nature has been advanced by many.

Pathology.—Thickening and deformity of the articular ends of the bones are found. The interarticular cartilages are eroded, and even absorbed, and exostoses grow from the margins of the articular surfaces of the bone

and may lock the joint. These changes differ from those of both gout and chronic rheumatism.

Symptoms.—There are two forms of importance: first, Heberden's nodes; second, the chronic progressive form. This generally begins symmetrically; the patient complains of pain and swelling and stiffness in the joints affected; gradually other joints become involved, and as the changes progress they become deformed, distorted, and stiff. The muscles atrophy and the patient may become entirely helpless, with the legs drawn up and the thighs flexed on the abdomen. There may be no pain whatever or there may be agonizing pain.

Diagnosis may be difficult at first, but is unmistakable later.

Treatment.—Salicylates, potassium iodide, cod-liver oil, arsenic, massage, local applications, hot air, hot springs and climate; good hygiene.

CHRONIC RHEUMATISM may follow acute, but is usually chronic from the onset. It generally comes on in old age, and is characterized by swelling, pain, and stiffness in many joints.

Morbid Anatomy.—The pathological changes are not the same as those of arthritis deformans. The synovial membranes are thickened, as also are the ligaments. No exostoses, however, are present, and but little change in the cartilages.

The prognosis is not good so far as an ultimate recovery is concerned.

Symptoms.—Pain, swelling, stiffness, all aggravated by bad weather. Often the stiffness wears off with exercise, and returns again in the morning after the night's rest.

The treatment is very unsatisfactory, as recovery from one attack is nearly always followed by relapses. Iodide of potassium, syrup of iodide of iron, sulphur, and guaiacum are of some use. Hot baths at various health

resorts are also highly extolled by some. Removal to a warm, dry climate is perhaps the best treatment for those who can afford it. Tonics and local applications to the joints are frequently indicated.

MUSCULAR RHEUMATISM.—Of doubtful *etiology*. It occurs after exposure and in various parts of the body. Most common as lumbago, pleurodynia, and torticollis or wry-neck.

Treatment consists in strapping the chest in pleurodynia and the use of porous plasters, dry cupping, and acupuncture in lumbago. Salicylates, potassium iodide, sulphur, electricity, and rubbing with sweet oil and turpentine are of use in all forms.

GOUT is a disease of nutrition, characterized by acute arthritis, by a deposit of sodium urate in the joints, and by constitutional symptoms, with an increase of uric acid in the blood.

Etiology.—There are many theories to account for the excess of uric acid. Among the predisposing causes are alcohol, overeating, lack of exercise, and heredity.

Morbid anatomy shows deposits of sodium urate in the articular cartilages and lobes of the ear and in and about the finger-joints, and in other situations more rarely. The blood contains an excess of uric acid, and there may be signs of disease of the arteries and kidneys.

Symptoms.—Acute gout is rarely seen in this country. It consists in acute arthritis, generally of right big toe-joint, coming on suddenly at about 3 A.M., and with great pain which usually lasts but a few hours, leaving a very sore joint for several days. A large discharge of urates takes place at the close of the attack.

Chronic gout follows acute. More joints are involved, principally in the lower extremities. The joints become swollen and stiff from the deposits of sodium urate. Arteriosclerosis is generally present and nephritis with associated hypertrophy of the left ventricle. Uræmia

often ends the patient's life. Pleurisy, pericarditis, and internal gout are serious complications.

There is a tendency of throat and eye specialists and dentists to call many conditions gouty which in reality are not so.

Diagnosis of acute gout is made by the observance of the swollen and painful toe-joint and the history of the onset occurring in a man accustomed to high living. Chronic gout is recognized by the deformed and swollen appearance of the joints in which sodium deposits have occurred.

Treatment.—Hygienic life and the use of colchicum and morphia, with careful regulation of the diet, and exclusion of heavy ales and beers, as well as sweet, acid, and strong wines, are the chief measures of treatment. The gouty person should take daily exercise of sufficient violence to cause the body to be in a glow.

DIABETES MELLITUS.—A nutritional disease, characterized by excretion of glucose in the urine and a great increase in quantity of urine.

Etiology.—Heredity, race, sedentary habits, with overeating, and injuries to the spine and brain. The disease is commoner in Europe than here.

The pathology is not constant. There may be found at autopsy tuberculosis, pneumonia, multiple neuritis, sclerotic change in the posterior columns of the cord. The pancreas often shows chronic fibroid change. Rarely a lesion of the floor of the fourth ventricle of the brain has been found involving the so-called diabetic centre.

Symptoms.—Diabetes may come on gradually or abruptly. Thirst is one of the earliest symptoms noted, and is usually accompanied by dryness of the throat. Voracious appetite, emaciation, and the passing of large quantities of urine shown to contain sugar complete the diagnosis.

Complications.—Tuberculosis, gangrene of the extrem-

ities and of the lung, eczema of the genitalia, pruritus, boils and carbuncles, arteriosclerosis, œdema of feet, diabetic coma, blindness, cataract, etc. Often death ensues from exhaustion.

Prognosis depends on the age of the patient and on the amount of sugar present in the urine. Fat people bear the disease better than thin, and old people better than young.

Treatment consists in the omission of starches and sugars from the diet and limiting to some extent water-drinking. Diet should consist in the main of meat, green vegetables, and gluten bread; no sugar or starch should be taken. Among drugs, morphine, codeine, antipyrin, sodium salicylate, jambul, creosote, strychnine, pancreatic extract, are all useful. Coma should be treated by alkalines, both by mouth and by intravenous injection.

DISEASES OF THE DIGESTIVE SYSTEM

GASTRITIS, or inflammation of the mucous membrane of the stomach, may be either acute or chronic.

Acute gastritis may come on without apparent cause, or may be due to overeating, to improper food, or to alcoholic excess. It is often a forerunner of the infectious fevers.

The symptoms vary according to the severity of the attack. In many instances there may be but a slight feeling of discomfort in the epigastrium, with some vomiting and diarrhœa, without fever. These symptoms may all disappear in twenty-four hours, or may be relieved immediately by the vomiting. In more severe cases the temperature is elevated, the pain more marked, the epigastrium very tender to pressure, the tongue heavily coated, the appetite completely lost, and the patient greatly prostrated.

The diagnosis in these latter cases is to be distin-

guished from the onset of an infectious fever, particularly typhoid, and sometimes from biliary colic and pancreatic disease.

The treatment is directed towards ridding the stomach of irritating food when present, and later towards soothing the inflamed membrane. The first purpose may be accomplished by producing emesis by giving the patient a glass of warm water, or by the use of calomel in divided doses. Nitrate of silver and bismuth subnitrate are of benefit for the second. The diet should be composed of milk and animal broths.

Chronic gastritis may be secondary to attacks of the acute form, or may be a result of other chronic conditions, such as Bright's disease, heart disease, liver disease, anæmia, and others. It is also commonly due to overeating and improper mastication of food, and is frequently of alcoholic origin.

Pathological changes are thinning of the mucous membrane, and the secretion of a thick, tenacious mucus. The stomach may be enlarged. Sometimes the mucous membrane is greatly thickened, thrown into folds, and may even project in the form of polypi.

The symptoms are those of indigestion. There may be a feeling of discomfort amounting to actual pain after eating. The tongue is coated, the appetite poor, though often capricious, and vomiting may occur with greater or less frequency. The early morning vomiting of drunkards is a well-known symptom of alcoholic gastritis. The bowels are constipated or diarrhœa may be present, the patient becomes sallow and anæmic, and the whole mental attitude is affected. Sometimes depression is present, in other cases there may be great irritability of temper.

Treatment.—Careful regulation of diet and habits of life should be insisted upon and the cause eliminated whenever possible. In severe cases a rigid milk diet

may be necessary, although in many a few simple directions in regard to the diet will suffice. Digestants, such as pepsin and pancreatin, aid very much in the assimilation of food, and the former is often combined with dilute hydrochloric acid. Nitrate of silver is given for its astringent and alterative action on the inflamed mucosa, quassia, and bitters, such as strychnia and gentian, for their stimulant action, and washing out the stomach is of benefit in many cases which resist other measures.

GASTRIC ULCER is more common in women than in men, and is caused by digestion of the mucosa owing to impaired nutrition.

Etiology.—Anæmia and chlorosis predispose to this affection; occupation also has some influence, though this is disputed by some.

Pathology.—Ulcer usually is single, generally situated posteriorly on the lesser curvature nearer the pyloric end of the stomach. Some ulcers are small and shallow and regular in outline; others are large, irregular, and deep. In healing they may contract and distort the stomach. An ulcer may perforate or cicatrize and cause stenosis at the pylorus.

Symptoms.—Dyspepsia, pain (aggravated by eating), tenderness, vomiting (the vomitus often containing clots of blood), and anæmia. Perforation is rarely one of the early symptoms.

Diagnosis is made by the symptoms and by examination of the stomach contents, which are frequently shown to contain an excess of hydrochloric acid.

Treatment.—Rest in bed is essential; poultices to the abdomen are of great service. The diet should consist of milk or albumin (egg) or beef-juice, cautiously increased after some weeks. Rectal feeding is necessary in some cases. For hemorrhage, rest, opium, and cracked ice by the mouth should be used. Local astringents are not of much use, but may be tried; bismuth, silver nitrate, and

oxalate of cerium are among the best. Surgical treatment is proper when frequent hemorrhages occur or when perforation results.

PERITONITIS, or inflammation of the peritoneum, may be acute or chronic, primary or secondary.

In men it is commonly secondary to appendicitis, in women to some ovarian or tubal disease.

The secondary variety is much the more common. The primary usually results from exposure to cold, and is sometimes spoken of as rheumatic in origin. Primary tubercular and cancerous peritonitis also exist.

Acute peritonitis may be due to inflammatory lesions, or to perforation, of the viscera.

The symptoms are sometimes ushered in by a chill, followed by fever, pain, vomiting, and a rapid, hard, wiry pulse. The abdominal muscles are rigid, the respiratory movement restricted, and the knees are drawn up to relax the abdomen, which is distended and tympanitic. If the inflammatory reaction is limited by adhesions, the patient may recover, but in a large majority of the cases of diffuse inflammation there is a fatal ending in from one to three days. The diagnosis is not always easy, though, as a rule, it becomes so as the case develops.

The cause of the peritonitis should be *treated*, when possible, by surgical methods. In inoperable cases morphia or opium should be given at intervals of two or three hours until the patient is under the influence of the drug. Cold compresses or hot flaxseed poultices may be applied to the abdomen and saline purgatives given internally.

APPENDICITIS is an inflammation of the vermiform appendix due to bacterial causes and mechanical disturbances produced by fecal concretions and foreign bodies, predisposed to by lifting, exertion, blows, etc.

There are *three forms:* (1) simple catarrhal, (2) ulcerative, (3) gangrenous or suppurative.

Simple catarrhal begins often after some gastro-intestinal disturbance. The pain is at first often in the stomach or generally over the abdomen, and finally becomes localized over the appendix. Vomiting and slight fever are present. In the course of a few days the patient recovers, though the soreness may remain longer. The ulcerative form results generally from foreign bodies. Suppuration and gangrene may follow either form. The whole appendix may slough off or but a portion, with the result of producing a local peritonitis with abscess or general peritonitis. One attack of appendicitis predisposes to others.

Diagnosis is made by studying the onset, which is abrupt, with fever, pain, and vomiting. It may be confused with renal and biliary colic, ovarian disease, and other conditions.

The treatment is operative when the diagnosis is assured, except in mild cases, when it is better to wait until the operation can be performed between attacks.

GALL-STONES are usually found in the gall-bladder, sometimes in the ducts, and are produced by any conditions which cause catarrh of the bladder and ducts. Micro-organisms play an important part, as they produce catarrh, and this catarrh in turn promotes the deposit of cholesterin and lime-salts in the bladder, of which the stones are chiefly composed.

Symptoms are not present until the stone is being passed down the duct, in which case there is biliary colic, with its attendant pain, faintness, nausea, and vomiting. The pain is sometimes referred to the right shoulder. Jaundice is present if the common bile duct be obstructed, but not if the biliary duct be alone involved. Sometimes fever is present of an intermittent type, similar to malaria, and accompanied by chills and sweats. After the stone is passed the symptoms abate and the patient gradually recovers.

Second attacks are likely to ensue, as gall-stones are rarely single. Untoward events may occur, such as retention of the stone in the gall ducts, or perforation of the duct may result.

The treatment consists in placing the patient in a warm bath, the administration of morphia, the application of hot compresses over the liver, and the use of saline laxatives and sweet oil internally. In the event of perforation taking place or of the stone becoming permanently lodged, surgical interference is demanded.

CIRRHOSIS OF THE LIVER occurs in *two varieties*, the atrophic and hypertrophic, of which the atrophic is most common. By cirrhosis we mean a disease characterized by overgrowth of connective tissue. Syphilis, gout, and congestion in heart disease are minor causes; the most common cause is alcoholic poisoning,—gin, whiskey, and wine, named in the order of frequency. The anatomical changes in atrophic cirrhosis consist in shrinking of the liver due to formation of connective tissue between the liver cells and the subsequent contraction of the same. The liver is light yellow or yellowish-brown, from which appearance the name *cirrhosis* is derived. It is evenly contracted and has a granular or nodular appearance on the surface. The abdomen generally contains dropsical fluid, particularly late in the disease.

The symptoms are those of gastric and intestinal catarrh. There is enlargement of the liver at first, subsequently shrinking, and the presence of fluid in the abdomen. Hemorrhage from the œsophagus or bowels, hemorrhoids, dilatation of the superficial veins of the trunk and abdomen are common symptoms. In hypertrophic cirrhosis, ascites (abdominal dropsy) is usually absent. Jaundice is rare in the atrophic variety, but is the rule in hypertrophic cirrhosis.

Treatment.—Potassium iodide and bichloride of mercury should be given in cases in which there is a history

of syphilis. Potassium iodide in arteriosclerotic cases.

When the accumulation of fluid in the abdomen becomes great enough to cause the patient distress, tapping should be resorted to. This may be done by placing the patient in an upright position at the edge of the bed, allowing the feet to rest on a low chair or a foot-stool. A broad, many-tailed abdominal binder should then be applied, with the tails gathered up in the hand behind in order that the slack may be taken in, and the binder tightened as the fluid is drained off. A small opening is cut in the front of the binder in the median line, usually at a point half way between the symphysis pubis and the umbilicus, through which the trochar and cannula are plunged. In dealing with patients who are nervous the skin must sometimes be first frozen with ethyl chloride before the trochar is introduced. Again, some physicians prefer making a small primary incision with a knife. After the fluid is thoroughly drained, a new binder is firmly applied and the patient given some stimulant if necessary. The value of the binder is in preventing a hemorrhage from abdominal vessels which might result from the withdrawal of the pressure of the fluid unless some other were substituted.

An operation has recently been devised for the cure of this condition, but is still in a somewhat experimental stage.

DISEASES OF THE BLOOD AND DUCTLESS GLANDS

ANÆMIA, or impoverishment of the blood, may be due either to a diminution in the total quantity of the blood or to a reduction of the hæmoglobin and corpuscles. In some instances the hæmoglobin is proportionately more reduced than the corpuscles, in others the reverse may be true. Anæmia may be primary or secondary. The primary or essential anæmias are chlorosis, progressive per-

nicious anæmia, leukæmia, Hodgkin's disease, and splenic anæmia.

Secondary anæmias may be due to a variety of causes, such as hemorrhage, cancer, lead poisoning, malaria, rheumatism, etc. Secondary anæmias are occasionally hard to distinguish from the primary when the original cause is obscure and the blood findings such as might be common to each.

CHLOROSIS is a disease usually found in young girls (rarely in men), which is characterized by a marked reduction of the hæmoglobin with but little change in the red cells. The cause is unknown; it has been ascribed to constipation and tight lacing, but with much better reason to confinement in schools or factories under bad hygienic conditions. Blondes are more often affected than brunettes.

The symptoms are dependent to a great extent on the degree of blood change. They consist in weakness, malaise, shortness of breath, constipation, scanty or absent menstruation, the patient at the same time becoming a peculiar greenish-yellow color, from which symptom the disease derives its name. The blood changes are characteristic and show a diminution of hæmoglobin in greater or less degree.

The prognosis is invariably good.

The diagnosis is made by the appearance of the patient, the age, sex, and finally by the blood-examination. Sometimes functional murmurs of the heart are discovered.

The treatment should aim at correcting any known cause and securing for the patient as favorable hygienic surroundings as possible. Iron is of great benefit, being specific in its action. It is usually given in the form of Bland's pill, and is sometimes aided by the administration of arsenic. Massage and rest in bed are sometimes advisable in the beginning of the treatment.

PROGRESSIVE PERNICIOUS ANÆMIA is characterized by a

great reduction in the number of red blood-cells, with reduction to a lesser degree of the hæmoglobin, changes in shape of the red cells, and the presence of nucleated red cells with a preponderance of megalocytes. The leucocytes are not much affected, merely reduced in number. The causes are unknown. Similar conditions are produced by hemorrhage and intestinal parasites, particularly the ankylostoma duodenale, and a species of tapeworm—tænia lata.

Symptoms.—Progressive weakness, pallor of the mucous membranes, yellow tint of skin, shortness of breath, palpitation of the heart, œdema of the ankles, fever, diarrhœas, vomiting, exhaustion and death. All with oftentimes little loss of bodily weight.

Pathology.—The bone-marrow is found to be red and jelly-like, and iron is found in the liver. The heart muscle is flabby and often the seat of fatty degeneration.

Prognosis.—Patients sometimes recover from one attack or from several attacks, but relapse and an eventual fatal termination is certain.

Diagnosis is made by the consideration of the above-mentioned symptoms and by the examination of the blood.

Treatment.—Arsenic is the remedy of greatest value and should be pushed to the physiologic limit. Bone-marrow is of value in some cases. Iron does not prove useful. Strychnia and digitalis are demanded in cardiac weakness.

EXOPHTHALMIC GOITRE, known also as Graves's disease, is a peculiar affection characterized by protrusion of the eyeballs, enlargement of the thyroid gland, and tachycardia.

Etiology.—Women are more frequently attacked than men. Beyond the fact that the symptoms are a result of hyperactivity on the part of the thyroid gland, nothing definite is known of the cause of the disease.

Appearance in Graves's disease.—Exophthalmic goitre. (Oppenheim.)

The symptoms, in addition to those already mentioned, are great nervousness, irritability, and mental depression. In cases where the thyroid grows very large there may be signs of tracheal obstruction; attacks of syncope are not uncommon, and the patient may die in one such. The disease may last for years or may prove rapidly fatal. The prognosis is always grave.

Treatment.—Rest and quiet are very essential. An ice-bag to the heart often relieves the palpitation and slows the rate. Bromides, digitalis, strophanthus, veratrum viride, and sodium salicylate are the drugs most commonly used. Electricity has proved valuable in some cases.

Surgical treatment is to be considered in those cases which do not improve under medicines. Partial removal of the thyroid is the procedure in use, together with ligation of the arteries supplying the parts that are not excised.

CHAPTER XI

Diseases of the Kidneys: Acute Bright's Disease, Chronic Bright's Disease, Parenchymatous and Interstitial Nephritis, Nephrolithiasis—Diseases of the Nervous System: Migraine, Tumor of the Brain, Abscess of the Brain, Apoplexy, Epilepsy, Hysteria, Neurasthenia, Locomotor Ataxia, Neuritis.

DISEASES OF THE KIDNEY

ACUTE BRIGHT'S DISEASE, or acute inflammation of the kidney (acute parenchymatous nephritis).

Etiology.—Exposure to cold and wet; toxic causes; pregnancy; infectious fevers, especially scarlet fever.

Pathological Anatomy.—The kidneys are either red, swollen, and dark throughout, or the cortex may be of a pale yellow hue, while the pyramids are deep red.

Symptoms.—The onset is often abrupt, with a chill and the early appearance of dropsy. When it is secondary to fevers the onset is more gradual, and puffiness under the eyes or at the ankles may be the first sign noted. Nausea, vomiting, and pain in the back are present. The urine is at first scanty or even suppressed, dark in color and high in specific gravity. This urine on examination is shown to contain red blood-corpuscles, albumin, and tube casts. At times the urine may be bloody in appearance. Uræmia may develop either at the onset or later. Anæmia is an early sign. The amount of dropsy is no indication of the amount of disease of the kidney.

The diagnosis is made by the observation of the above-mentioned symptoms and examination of the urine of the patient.

CHRONIC PARENCHYMATOUS NEPHRITIS is that form of

Bright's disease in which the parenchyma or secreting cells of the organ are affected.

CHRONIC INTERSTITIAL NEPHRITIS is a condition in which the inflammatory change takes place in the connective tissue of kidney, and results in the so-called contracted kidney. It may be compared, pathologically, to atrophic cirrhosis of the liver.

CHRONIC BRIGHT'S DISEASE, either parenchymatous or interstitial, may follow acute nephritis, or may come on insidiously without any acute symptoms.

Etiology.—Heredity, alcohol, syphilis, overeating, and arterial disease are among the commoner causes.

Symptoms.—Dropsy is often the first symptom noted and is followed by shortness of breath, anæmia, loss of appetite, scanty urine, and weakness. Later more serious symptoms develop, such as cardiac hypertrophy, retinal hemorrhage, blindness, œdema of the lungs, and dropsy of the pleura. The voiding of large quantities of pale urine of low specific gravity, containing very small quantities of albumin and tube casts is characteristic of the interstitial variety. The pulse is of high tension, and there is often great hypertrophy of the left ventricle. Indigestion, headache, and backache may be present, but are in nowise typical.

Diagnosis is made by the history and appearance of the case and by the examination of the urine, which discovers the presence of albumin and tube casts.

Treatment.—Rest and a diet free from irritating foods or alcoholic drinks; tonics containing iron and mild diuretics, including hot air and steam baths. Removal to a warm, dry climate, such as is found in Egypt and the Madeira Islands, often proves beneficial.

NEPHROLITHIASIS, or stone in the kidney, is a condition in which a stone is formed either in the tissue or pelvis of the kidney. The stone may be formed of uric acid, oxalate of lime, or phosphates. Commonly, two of these

substances are present in the same stone, and the size and shape may vary greatly. The cause is dependent on the nature of the stone concerned. In uric acid stone the causes are those which conduce to a gouty or uric acid condition, such as overeating, and drinking of alcoholic liquors, combined with lack of exercise. In the case of stone in the kidney tissue there may be no symptoms whatever or there may be more or less constant pain, aggravated by motion. Sometimes blood or pus may be present in the urine under this circumstance, but more rationally such a phenomenon would point to the location of the stone in the pelvis of the kidney. When the stone passes down one or another ureter the symptoms of renal colic result. There is intense pain in the back, nausea, prostration, and often suppression of urine, even though one ureter be free. Following the passage of the stone, the urine is generally bloody and may contain some leucocytes. The passage of fine gravel often gives rise to no symptoms whatever.

The diagnosis is not always easy, though the existence of renal colic is usually readily recognized. The X-ray will sometimes give valuable testimony.

The treatment may be considered from three points,—immediate renal colic, the presence of stone in the kidney or pelvis, and the diathesis, which causes the stone.

Renal colic is treated by placing the patient in a warm bath and administering morphine hypodermically and placing hot poultices over the affected side. When the presence of stone in the kidney substance or in the pelvis is assured, a surgical operation should be performed and the stone removed. In those of uric acid diathesis the amount of meats in the diet should be reduced to a minimum and alcohol interdicted. A certain amount of exercise should be insisted on. Alkaline mineral waters should be prescribed and salts of lithia and sodium added if necessary.

In the alkaline or phosphatic diathesis the reverse conditions exist, and the diet should be composed of a fair share of meat, while the alkalies should be combated by the use of acid mineral waters and boric and benzoic acid. The free ingestion of water is of benefit in both the alkaline and acid diathesis.

Treatment.—Rest in bed, milk diet, diluent drinks, and the relief of the kidneys by purgation and sweating. The latter may be brought about by means of the hot-air bath or the hot pack, aided by the use of pilocarpine hypodermically. Wet and dry cups over the back are of benefit at the onset. Tonics and sedative diuretics are of use in convalescence. The greatest care should be taken that the patient does not become chilled.

If uræmic symptoms appear, blood should be withdrawn in quantities of from fifteen to twenty ounces in adults and free sweating and purgation immediately induced. Complete recovery is possible, but oftentimes the disease recurs or becomes chronic.

DISEASES OF THE NERVOUS SYSTEM

MIGRAINE is the name given to a severe headache which begins usually on one or other side of the head. The paroxysm may be accompanied by vomiting, or, as is often the case, may end in this way.

The causes are heredity, nervous exhaustion, constipation, and "biliousness."

The attack begins sometimes without warning with numbness of one side of the head, tongue, and sometimes of the arm. The vision is much blurred and large spots float before the eyes. Some severe unilateral pain develops, which in time may become general; the patient feels nauseated and vomits an acid fluid, when the attack usually gradually ends.

Treatment.—The patient should lie down; ice may be placed on the forehead, and small doses of calomel given.

Phenacetine, combined with caffeine, may be advantageously taken at the same time. Subsequent attacks may be avoided by paying exceptionally careful attention to the digestion. Many sufferers from this complaint spontaneously recover with advancing years.

TUMOR OF THE BRAIN may appear without apparent cause, and in so-called healthy people. The cardinal symptoms are vertigo, headache, and vomiting. There may also be incoördination, nystagmus, convulsions, delirium, unconsciousness, coma, blindness from optic neuritis, deafness, and paralysis. The optic neuritis and choking of the optic disc are very characteristic and are seen in a large proportion of cases. The vertigo is in nowise characteristic; the headache may be general or local, in the front or back of the head, and the vomiting occurs without signs of stomach trouble.

The tumor may sometimes be located by "focal" symptoms,—*i.e.*, symptoms pointing to a motor area of the brain; often it is difficult to so localize the growth.

The prognosis is bad in all cases, the patient usually dying in a few weeks or months, though sometimes lingering on for years. In cases of syphilitic nature the prognosis is more favorable.

Treatment is of little avail. Occasionally removal of a localized tumor has been performed, but such procedure is scarcely, as yet, warranted by results.

ABSCESS OF THE BRAIN is usually secondary to some focus of suppuration. Middle-ear and mastoid disease are the most common forerunners. Blows upon the head, general septic infection, and malignant heart disease may also cause it.

The symptoms are both cerebral and general. There may be chills and fever, great headache, vomiting, mental dulness amounting to stupor, convulsions, and optic neuritis. The disease is rapidly fatal, unless the position of the abscess can be located and the contents drained. If

the abscess be superficially situated the chance of recovery is comparatively good.

APOPLEXY (stroke of paralysis) is always taken to mean paralysis following hemorrhage into the brain. Literally, the term means "a blow or stroke," and no limitation to the brain is included in the definition.

Hemorrhage takes place in the brain as a result of the rupture of a vessel, and the one that most commonly gives away is the lenticulostriate artery.

Etiology.—Apoplexy is a disease of advanced life, rarely occurring before the age of forty. The reason for this is that a vessel of the brain will not rupture unless it be diseased, and arteriosclerosis is a disease of middle and later life. Those conditions which promote arteriosclerosis therefore predispose to apoplexy. The exciting causes may be excitement, exertion (as, for instance, the act of defecation), and any unusual indulgence in alcohol or overeating.

Symptoms.—These may come on very abruptly or there may be warnings, such as attacks of vertigo, fulness in the head, ringing in the ears, and headache. The patient then becomes unconscious and falls to the ground. There may be a convulsion, followed by profound coma, or the coma may exist from the onset. The face is dark and flushed, the eyes injected, the cheeks flapping, and the breathing stertorous, while there is general muscular paralysis, which, however, even at this period may sometimes be more pronounced on one side than the other. The patient may die almost at once, or linger on in a comatose condition for some days, or after a varying period may slowly regain consciousness. When consciousness returns and with it the power of motion, it becomes possible to determine the extent of the damage. Usually one side or the other is found to be more or less completely paralyzed, and, if the right side be the one affected, the power of speech is usually also

lost in right-handed people. There is usually incontinence of urine and fæces, and it is most important for the nurse to keep in mind the necessity of evacuating the bladder at stated intervals. The paralysis may improve very rapidly, particularly in the legs, until a certain point is reached, beyond which it cannot go. Eventually there may be contractions of the paralyzed parts, particularly the arm.

The symptoms are due either to destruction of brain tissue by the sudden outpouring of blood under pressure or to a secondary inflammation from the same cause. Very frequently both factors are parties in the result. The improvement noted early in the cases of those who recover is due to the absorption of the clot of blood extravasated from the blood-vessel, and the limitation of improvement is due to the fact that some tissue has been irretrievably injured by this extravasation.

The treatment is directed at first towards preventing further hemorrhage, and, secondly, towards improving the paralyzed parts and the general health, and lessening the danger of future attacks. At the onset the patient should be kept perfectly quiet; ice should be applied to the head and some purgative administered, such as croton oil or salts. Morphine and hyoscine may be given if the patient is very restless, and iodide of potassium later on to aid absorption of the clot. For the condition ensuing upon the attack, massage and electricity are of value in treating the paralysis. The patient should live a careful life, and avoid excitement, overeating, and the use of alcohol.

Epilepsy.—There are, as previously stated under the head of "Medical Emergencies," two general clinical divisions of epilepsy,—grand mal and petit mal.

Grand mal is the commoner, and is accompanied by the epileptic fit. Petit mal is characterized by a momentary loss of consciousness without a fit. This uncon-

sciousness may be of but a few seconds' duration or it may last a few minutes. Sometimes the patient falls to the ground, at others he merely pauses in what he is doing and saying, and almost immediately resumes his occupation as though it had not been interrupted.

Jacksonian epilepsy, or focal epilepsy, is a condition where a local convulsion in a group of muscles or in a whole limb occurs without unconsciousness.

The status epilepticus is a state in which the patient has convulsion after convulsion, which may result in exhaustion and death.

Nocturnal epilepsy occurs only at night, and the only suggestion of its existence may be the feeling of stiffness and soreness on the morning after a convulsion, coupled with a bitten tongue.

Epilepsy rarely begins after thirty years of age. More commonly it begins at or about the age of fifteen. Hereditary histories of epilepsy, syphilis, alcoholism, or insanity are frequently obtained. Sometimes convulsions occur which are epileptic in type but of reflex origin, such as those due to worms, constipation, etc. These are known as epileptiform convulsions.

The symptoms of grand mal, or true epilepsy, are as follows: Preceding the fit there is commonly what is known as an aura, which may be motor, sensory, or psychical. The patient then gives an epileptic cry and falls to the ground unconscious. At first the condition is one of tonic spasm, which lasts but a short time and is succeeded by clonic convulsions. Unconsciousness is profound and convulsive movements are severe. The teeth churn up the saliva into froth, and often the froth is blood-tinged from wounds of the tongue. Urine and fæces may be discharged involuntarily. This stage lasts a few minutes and gradually the convulsion abates and disappears. Following the convulsion the patient is comatose and will often sleep for hours unless aroused,

and when aroused he will have no recollection of events and is confused mentally and tired out. After fits there are noted many curious mental conditions, which are often introduced in evidence in murder trials to condone a crime committed by an epileptic. Mania may be substituted for a fit, and also automatic and violent, apparently purposive, actions.

The diagnosis is usually easily made. Epilepsy is, however, to be distinguished from hysterical convulsions.

The prognosis is bad in regard to complete recovery. The usual outcome of cases in which the fits are frequent is terminal dementia. In those who have few fits and in whom treatment is effective a cure may result or at least the malady may be held in check.

Treatment.—Good hygienic surroundings. Bromides are the most useful drugs to lessen the number and severity of the convulsions. During a convulsion the clothes should be loosened and something thrust between the teeth to protect the tongue. Nitrite of amyl or chloroform may be given if the fit be very long or several occur in succession.

HYSTERIA is "a state in which ideas control the body and produce morbid changes in its functions." From this definition it will be readily understood that the disease is primarily one of the brain and that the changes in the rest of the body are secondary. It is more common in women than in men, and rarely develops before puberty. Activity and irritability of the nervous system strongly predispose to it. Bright, imaginative girls are prone to it, and the French and Jews for this reason are commonly affected. Heredity, education, and mode of life, anxiety, grief, and overwork, all conduce to it. It sometimes occurs in epidemic form in institutions. It results often from overindulgence by parents and consequent want of self-control, coupled with lack of proper physical development.

Symptoms.—Hysteria may simulate any nervous disease, and, in fact, almost any disease whatever. Motor, sensory, vasomotor, secretory, trophic, sensorial, and psychic manifestations may occur.

There are *convulsive and non-convulsive forms.* The convulsive form begins generally with emotional symptoms, laughing and crying, and a sense of choking in the throat, pain in abdomen, chest, or back. The patient then falls, but always without injuring herself, and has a convulsion with apparent loss of consciousness. Sometimes coma is present without the convulsion. Catalepsy is hysteria of the comatose type, and is rare in this country. The non-convulsive forms are made up of paralyses, contractures, anæsthesia, hyperæsthesia, blindness, deafness, hiccough, cough, rapid heart, high temperature, etc.

Treatment requires firmness on the part of the physician and nurse without sentimental sympathy. It is necessary to recognize the condition as a pathological one, and not mere shamming. Great injustice has been done hysterical patients by being too harsh, and, on the other hand, they have worn out and brought to early graves members of their overanxious and sympathetic families. Morphia should never be given for the pains. The rest treatment as practiced by Dr. S. Weir Mitchell has been of the greatest value in dealing with these cases. It consists in regular systematic carrying out of a course of isolation, diet, rest, and exercise by massage, and depends for its success largely on the intelligence and faithfulness to detail of the nurse.

NEURASTHENIA.—Exhaustion of nervous system, producing mental and bodily alterations of function.

Etiology.—Here, as in hysteria, heredity plays an important part. Overwork and mental strain are the exciting causes. Mental depression, egotism, anæmia, loss of weight, headache, hyperæsthesia, weakness amounting

almost to paralysis, and a large train of such symptoms may be separately or collectively present.

Treatment.—Removal of the cause when possible, change of climate and scene, and tonics in the milder cases. In the more severe forms a rest-cure is called for, but the recovery may be slow and incomplete. Neurasthenia is frequently a forerunner of insanity, and should therefore always be regarded as serious.

LOCOMOTOR ATAXIA is a degenerative disease of the posterior columns of the spinal cord, associated with ataxic movements and loss of power of the lower limbs.

In a very large proportion of cases there is an antecedent history of syphilis. This history is usually an old one, and the changes in the cord are not to be regarded as actively syphilitic, nor can they be benefited by antisyphilitic treatment, except in cases of recent infection. Very hard laboring work, combined with exposure, is conducive to its onset. The early symptoms are oftentimes rather vague and may not be recognized. These are the so-called lightning pains down the legs, disturbances of the muscles of the eyes, optic atrophy, inability to stand either in the dark or with the eyes shut, and loss of knee-jerk. As the disease progresses, the ataxic gait increases so that the patient can walk only with the assistance of canes. There may be incontinence of urine, girdle-pains, blindness, destructive changes in the joints, and the so-called crises, such as gastric or laryngeal attacks, in which there is great pain in the stomach with violent vomiting, or in the laryngeal type there may be spasmodic contraction of the larynx with great dyspnœa.

In some cases trophic changes take place. The knee-joint is often the seat of such change, and undergoes a process similar to that of rheumatoid arthritis. The course of the disease is usually very slow and may remain stationary for a number of years at any stage.

Even when the paralytic stage is reached the patient may live on indefinitely.

The prognosis is bad in respect of cure, but undoubtedly in certain cases there is arrest of progress.

The treatment is largely symptomatic. Iodide of potassium and mercury may be tried, particularly if the syphilitic history is recent. Nitrate of silver is of value; morphia and phenacetine are useful for the pains. Physostigma and bromides are of value in quieting nervous symptoms. The bladder may have to be regularly evacuated by catheter, in which case the greatest care should be exercised not to infect the bladder. Massage, electricity, and baths of various kinds have some mental effect on the patient, but do not influence the disease to any appreciable extent.

NEURITIS, or inflammation of a nerve, may be either local or multiple. When local it is commonly due to some local cause, as, for instance, a blow, a local infection, or to pressure. Multiple neuritis, on the other hand, is generally due to some infectious or toxic agent, as is the case in that following diphtheria, typhoid, scarlet fever, and other infectious diseases. Among the toxic causes are lead, arsenic, alcohol, and others in lesser degree of frequency.

The symptoms of neuritis are pain over the trunk of the inflamed nerve, sensations of numbness and tingling in the parts supplied, and impairment or even loss of motor function. Later, trophic changes may develop, such as wasting of the muscles and glossiness of the skin, and changes in the nails of fingers or toes.

The paralysis due to diphtheria toxin, curiously enough, affects the muscles of the soft palate, producing a change in the voice and regurgitation of liquids through the nose. Lead also exercises a selective preference in the matter of the nerves affected, those supplying the extensor muscles of the arm being most often

attacked. The musculospiral nerve is often pressed upon by a crutch, with resulting wrist-drop, a symptom also commonly seen in persons who have slept heavily with the armpit pressing on the sharp back of a chair.

The prognosis, as a rule, is favorable, though depending on the amount of destruction of nerve tissue, and this can only be surmised by the degree and persistence of the paralysis.

Treatment.—The parts affected should be placed at rest and soothing applications, such as lead-water and laudanum or ichthyol ointment, applied. If the arm be affected, it is often well to apply a splint in the early stage. Phenacetine, bromides, or even morphia should be given to ease the pain. When the more acute stage has passed, counterirritation by the use of iodine, blisters, or the actual cautery may be employed, or massage, electricity, and passive movements.

CHAPTER XII

Diseases of the Respiratory System: Hay Fever, Laryngitis, Emphysema, Acute and Chronic Tonsillitis, Acute and Chronic Bronchitis, Bronchial Asthma, Broncho-Pneumonia, Pleurisy—Diseases of the Circulatory Organs: Weakness of the Myocardium, Pericarditis, Adherent Pericardium, Dropsy of the Pericardium, Dilatation and Hypertrophy of the Heart, Fatty Heart, Myocarditis, Valvular Heart Disease, Angina Pectoris, Arteriosclerosis, Aneurism—Intoxications: Alcoholism, Delirium Tremens, Morphia Habit, Lead Poisoning, Heat Exhaustion and Sunstroke.

DISEASES OF THE RESPIRATORY SYSTEM

HAY FEVER (rose cold) is an affection characterized by an inflammation of the nasal mucous membrane. Sometimes the conjunctival and bronchial mucous membranes are also affected.

Etiology.—The disease occurs either in the spring or fall, or in both, and has some relation to the pollen of certain plants, rag-weed and golden-rod particularly. The regularity of recurrence is very remarkable, and certain mountain resorts annually on a regular date have a large influx of sufferers from this disease who have timed the arrival of the symptoms to the very day.

Usually hay-fever patients have some abnormality of the nasal chambers, which, however, seems to have little to do with the symptoms. The upper classes are more often attacked than the poorer, males more often than females; the disease rarely makes its appearance in persons who have passed the forty-year mark.

The symptoms consist in hyperæmia of the nasal mu-

cous membranes, accompanied by a clear, glary discharge. The eyes may smart and appear injected, and quite commonly asthma co-exists. The attack continues until some locality is sought which is free from the objectionable pollen or until the pollen-forming stage of the plants above mentioned is over.

The attack is not serious in itself, but when asthma is present the patient's constitution suffers very much from the exhaustion incident to loss of sleep. The prognosis in regard to a cure is bad unless the patient can remove to a suitable climate. Recurrence year by year is to be expected.

Treatment is in the main local. Sprays of Dobell's solution and glyco-thymoline; applications of adrenalin, cocaine, and Dunbar's serum may be made. In those of neurotic disposition tonic treatment and rest may be of benefit.

LARYNGITIS is an inflammation of the mucous membrane of the larynx.

Etiology is the same as that of bronchitis, the attack in most instances resulting from exposure to cold or wet. It may, however, follow overuse of the voice in speaking or singing. Rarely it may also be of diphtheritic origin without the appearance of simultaneous lesions on the tonsils or pharynx.

The symptoms consist in a change of the voice, or perhaps total loss of voice, some pain in the larynx (though in a number of cases the disease is painless), and a dry, annoying cough. As a rule, constitutional symptoms are not present to any great extent, unless the pharynx or tonsils are also affected.

The treatment consists in placing the larynx at rest by prohibiting undue use of the voice. Expectorants are of some use. Dover's powder, quinine, and a hot bath at the onset may either abort or shorten the course of the attack. In the more chronic forms or in those

secondary to tubercular or syphilitic disease special treatment is required.

EMPHYSEMA is a disease of the lung in which there is overdistension of the air-vesicles and atrophy and rupture of the intervesicular connective tissue.

Etiology.—The condition is induced by occupations which call for severe exertion of the respiratory function, and is therefore more common in men than in women. There is probably some inherent weakness on the part of the intervesicular tissue also, as it would be hard to explain the occurrence of the disease in one person and not in another placed under similar circumstances. The blowing of wind instruments is a well-recognized cause.

Pathology.—The lungs are larger than normal, overdistended and bladder-like areas are present which are due to the coalescence of several groups of vesicles. Chronic bronchitis is nearly always present, and also hypertropy of the right side of the heart from the extra exertion demanded to push the blood through resistant channels.

The symptoms are those of shortness of breath (due to diminished elasticity and expansion of the lung), cough, and cyanosis. In marked cases the patient presents a very miserable picture. He is unable to lie down, and fights for breath. Cough is frequent and quite often ineffectual in bringing up the collected mucus. Sometimes ascites develops and the patient may die of exhaustion or intercurrent pneumonia. The chest is greatly enlarged, particularly in the anteroposterior direction, and flares out at the base (the so-called barrel-chest). Expansion is greatly diminished and often is not greater than a half-inch.

Prognosis.—The condition tends to recur and to grow steadily worse. In any particular attack the outcome depends upon the presence or absence of complications.

Treatment.—In those cases in which the cyanosis is marked, free bleeding often gives great relief. Morphia and atropia are of value in combination. Strychnia and iodide of potash favorably affect the heart and the bronchi. Between attacks the patient should not overexert himself and should take great precautions to prevent taking cold.

TONSILLITIS, or inflammation of the tonsils, may be acute or chronic. The acute form is more common in adults, the chronic in children.

The acute form is characterized by a redness and swelling of the tonsils and the appearance of discrete, white plugs in the lacunæ. Sometimes this exudation may spread all over the tonsils and very closely resemble the membrane of diphtheria.

Etiology.—Tonsillitis is often due to exposure to cold and wet or may be of rheumatic origin. It is often seen in connection with diphtheria epidemics. A predisposition to this affection is noted.

The symptoms usually begin with a chill. There is soreness of the throat, difficulty in swallowing, fever, headache, backache, and prostration. The cervical glands are also enlarged and painful, but do not suppurate. Both tonsils are affected, though often in different degrees.

The diagnosis is made by the characteristic changes in the throat, and the disease may be differentiated from diphtheria by noting that the exudation of tonsillitis occurs in discrete areas, while the membrane of diphtheria is continuous. In those cases where the tonsillar exudation becomes continuous the diagnosis is more difficult. A valuable point is the ease with which a tonsillitis exudation may be removed from an affected tonsil, leaving a smooth surface beneath, while in the case of diphtheria a membrane can only be removed by force and leaves invariably a bleeding, raw surface.

Treatment is both local and general. Locally, sprays and gargles of Dobell's solution, Seiler's tablets, glycothymolin, or hydrogen peroxide may be used. The nose also should receive attention and should be frequently sprayed. Tincture of chloride of iron and quinine, Dover's powder, and salicylates should be ordered, the latter particularly in cases of rheumatic nature.

CHRONIC TONSILLITIS.—A slow-going hypertrophic process—most common in children.

Etiology.—It may be secondary to some infectious disease or may be primary.

The symptoms depend on the degree of the enlargement. There may be mouth-breathing, deformity of the face and chest, and mental backwardness in severe, long-continued cases.

The treatment is purely surgical; the tonsils should be guillotined as soon as the necessity arises. No medical treatment is of any avail in well-marked cases.

ACUTE BRONCHITIS is an inflammation of the bronchial tubes, accompanied by cough and expectoration.

The commonest cause is exposure to cold and wet, though it is often secondary to other diseases, such as measles and influenza. It is more common in winter than in summer, and is often the result of extension of inflammation from an ordinary sore throat. The onset may be preceded by a chill, followed by fever of a mild degree. There is usually some coryza, a cough which is at first hard and dry, and later looser, with expectoration, some pain in the chest, and general malaise. In healthy young people with ordinary care such symptoms will disappear rapidly in the course of a few days. In older people the condition is often much more obstinate, and may become chronic.

Physical signs may be altogether absent or there may be dry and moist râles heard on auscultation.

Treatment consists in the administration of sedative

expectorants at first, to be followed by stimulating ones later. A mustard-plaster over the chest is of benefit at an early stage. At the onset of an acute bronchitis, or acute cold, as it is commonly termed, if ten grains of quinine and from five to ten grains of Dover's powder be taken, followed by a hot bath and bed, the attack may be greatly modified or aborted.

CHRONIC BRONCHITIS may develop from frequent attacks of the acute, or may be chronic from the onset. It is secondary to very many conditions, such as emphysema, chronic Bright's disease, asthma, and others. It is more commonly found in middle or later life. It is characterized by cough, usually more severe in the morning, and by more or less free expectoration. In some cases this expectoration may be upwards of a pint per *diem;* in others it may be almost absent. The sputum is usually yellow or greenish, either thick or sometimes very thin. It is offensive in odor in those cases where the bronchi have become dilated and the sputum has collected and been retained for some time.

The prognosis is not hopeful where the condition is secondary to emphysema or to some incurable primary cause. Careful hygienic living and removal to a warm, dry climate often effect a cure. Stimulating expectorants, such as turpentine and its derivatives, creosote, and ammonium carbonate, are useful.

BRONCHIAL ASTHMA is a disease in which there are attacks of great shortness of breath, occurring in persons who enjoy good health between these attacks. There is no pre-existing or accompanying respiratory disease. The attacks therefore may be regarded as spasmodic in nature, and may be excited by reflex nervous causes. The smaller bronchial tubes are the ones most affected, and the diaphragm also seems to participate, being limited in its excursion. The onset is abrupt and without warning, while the patient is so short of breath that he

is unable to lie down and scarcely able to speak at any length. While both respiratory acts are embarrassed, the chief difficulty is with expiration, therein making a sharp line of distinction between this disease and a shortness of breath due to obstruction of the larynx or trachea. The attack may be accompanied by some coughing and expectoration, but usually cough is not present and expectoration is scanty. This expectoration sometimes contains little firm plugs of mucus, which under the microscope are seen to be spiral in shape (Curschmann's spirals). It also contains peculiar octahedral crystals (Leyden's crystals) and an abundance of eosinophile cells. The attack may last but a few hours or several days or even weeks, but in the latter case there are usually intermissions and exacerbations.

The diagnosis is usually readily made, though it is important to exclude heart and kidney disease as possible factors in producing a secondary asthma.

The breathing is seen to be difficult, particularly expiration, and on auscultation very numerous, sonorous, sibilant, and creaking râles are heard all over the chest. The percussion note may be slightly higher in pitch than normal, but no dulness is present.

The prognosis is good in regard to the individual attack, but subsequent ones are apt to follow.

The treatment during an attack consists in administering chloral hydrate, nitrite of amyl, and the fumes of nitre-paper or stramonium by inhalation. Iodide of potash and arsenic may be administered between attacks with a hope of permanent cure.

Broncho-Pneumonia, or catarrhal pneumonia, is an inflammation of the lobules of the lung, resulting in a consolidation of a lobule or groups of lobules. The disease occurs either as a primary or secondary affection. Thus, in children, it may follow measles, whooping-

cough, rickets, summer diarrhœa, and many other diseases, and in adults, typhoid fever, Bright's disease, and other conditions. It may be tubercular or it may be due to the inhalation of ether, food, or other irritating particles. In onset it may be abrupt, but is not usually so acute as croupous or lobar pneumonia. Fever and cough are present, respiration is rapid, and the lips are apt to be blue. The pulse also is rapid. After a course of about a week the symptoms subside by lysis. In secondary cases the course may be much longer.

Physical signs depend on the amount of area involved. Auscultation discloses the presence of fine subcrepitant râles and bronchial breathing over a consolidated area usually of limited size.

Treatment consists in the administration of expectorants, and stimulants when necessary. In children, when the shortness of breath and blueness of the lips are marked symptoms, great relief is afforded by producing free emesis. The primary cause should, of course, be also treated in the secondary forms. Sponging or the cold pack may be used to control the temperature.

PLEURISY, or inflammation of the pleura, is either primary or secondary. Commonly, it is secondary to pneumonia, phthisis, and Bright's disease. It may be primarily tubercular.

Pleurisy may be either dry or plastic, or accompanied by effusion. The pleura under these conditions is congested, flakes of lymph are found on its surface, and fluid, either clear, purulent, or bloody, in its cavity. In healing, the two layers of the pleura may adhere and obliterate the cavity, or adhesions may form between the lungs and chest wall, or a permanently thickened pleura may remain as an after-result. The physical signs of dry pleurisy are creaking friction râles heard on auscultation, similar to the sounds made by bending heavy new leather. There is stitch-like pain in the side, fever,

and a dry, suppressed cough. Respirations on the affected side are shallow and rapid, owing to the pain, and the patient lies on the affected side. When fluid forms there is flatness on percussion, absence of breath-sounds, and displacement of the heart, outwardly in a right-sided effusion, inwardly in a left. There may also be great respiratory discomfort. If the effusion be of purulent nature the temperature is of septic type.

The treatment differs according to the nature of the pleurisy. In the dry variety turpentine stupes may be applied, or the hot-water bag or mustard-plaster. Painting the chest with iodine sometimes gives relief, as does also strapping the chest with adhesive plaster. Internally sodium salicylate and potassium iodide are useful. In the event of the formation of fluid, it should be withdrawn by the aspirator. When pus is present a surgical operation is required.

DISEASES OF THE CIRCULATORY ORGANS

WEAKNESS OF THE MYOCARDIUM, or cardiac insufficiency, occurs when too great a strain has been put upon the heart muscles. Such weakness is seen in chronic valvular disease, chronic respiratory diseases, constrictions and dilatations of the aorta or pulmonary arteries, arteriosclerosis, chronic nephritis, and from toxic causes, such as overuse of alcohol, coffee, tea, and tobacco.

Symptoms.—A rapid, irregular heart, a sense of palpitation felt by patient, an apex-beat feeble or even absent, finally œdema of the legs, and the picture of general failure of the circulation may exist.

Pathological alterations are weakness and flabbiness of the heart muscles and the other changes due to congestion of organs.

The prognosis is bad.

Treatment.—Removal of the cause; rest in bed, milk

diet; ice-bag to heart if there is pain and palpitation. If these measures do not yield results, cardiac tonics and stimulants must be used, such as digitalis, strychnia, strophanthus, camphor, ether, whiskey. For temporary heart weakness, aromatic spirit of ammonia, brandy, ether.

PERICARDITIS.—An inflammation of the pericardium—may be either primary or secondary. Most commonly it is secondary to rheumatism, but sometimes follows tonsillitis. It may also be secondary to scarlatina, pneumonia, and other infective diseases. It may be of tuberculous origin, either primary or secondary. It not infrequently follows Bright's disease, and is a terminal infection in many chronic ailments. It is often septic and may occur by extension of inflammation from ribs or pleura. There are three forms: (1) acute plastic; (2) pericarditis with effusion, which may be serofibrinous, hemorrhagic, or purulent; (3) chronic adhesive.

Acute plastic is the most common. In this form there is a small amount of exudate present. Where the two layers are separated the appearance is that of buttered surfaces. In cases where the effusion is greater there may be fibrinous layers present.

Symptoms.—Often the onset is insidious, and unless the condition be looked for it may pass unnoticed. There may be great pain. Fever is present, but, as the pericarditis may be secondary, it is often not ascribed to the true cause.

Physical signs.—Inspection negative. On palpation friction may be felt near the sternum in the fourth or fifth interspace. Auscultation yields a double to-and-fro friction sound which is near to the ear and has a sound distinct from the endocardial murmurs.

Pericarditis with effusion is an after-result of the former; and sometimes comes on without symptoms pointing to the heart.

Morbid Anatomy.—A thickening of both layers of the pericardium, the presence of lymph and fluid, either serofibrinous, hemorrhagic, or purulent. The heart muscle underlying may show granular change or even fatty degeneration.

Symptoms are at first few. Pain is commonly present at the onset. Later, when effusion is present there is shortness of breath, rapid, small, and irregular pulse, and disappearance of pain. There may be present the phenomenon known as pulsus paradoxus,—*i.e.*, a lessening of the pulse volume with inspiration. The patient often is unable to lie down. There may be mental symptoms, such as melancholia or mania, and a fatal termination is preceded by restlessness, delirium, and coma.

Prognosis is good in the serofibrinous variety; good also when secondary to rheumatism. Purulent and septic forms are much more serious.

Diagnosis is often difficult. Sometimes it is confounded with dilatation of the heart or with pleural effusion.

Treatment.—At onset absolute rest and quiet are essential. Aconite and digitalis may be given to quiet the heart action. Neither, however, is as good as an ice-bag. Local bleeding by leeches or wet cups may be used. After effusion takes place saline purgatives should be given every other morning, and digitalis and acetate of potash to increase the urinary secretion. Blisters, sodium salicylate, iodide of potash are all useful, and surgical interference in purulent cases is necessary.

Adherent Pericardium may consist in simple adherence of the two layers of the pericardium,—a result of the two former kinds of pericarditis, or adherence of the pericardium to the pleura, diaphragm, or chest wall,—a very much more serious affection, as it leads to great hypertrophy of the heart and finally to relative incompetence and general heart failure.

Diagnosis.—Inspection shows enlargement and bulging of the præcordium, great enlargement of cardiac impulse, and retraction at the apex. Retraction also may be seen along the lower border of the ribs when adherence to the diaphragm is present. This phenomenon may also be seen posteriorly between the eleventh and twelfth ribs. On palpation the apex beat will be found fixed in position, no matter how the patient be moved. Percussion shows an increased area of cardiac dulness. Auscultation may show the presence of endocardial murmurs.

Treatment.—No treatment does the condition any good. Excitement and overexertion should be avoided.

Dropsy of the Pericardium is always secondary to heart or kidney disease or to some other condition which may produce general anasarca.

Dilatation of the Heart may be acute or chronic; may be confined to one side or affect both sides of the heart. The condition is produced either (1) by diminished resistance of the myocardium or (2) by greatly increased blood-pressure. (Hypertrophy may also be present.) Diminished resistance of the muscle is present in infectious fevers, anæmia, and other conditions of weakness.

Increased blood-pressure causing dilatation is present in aortic disease, and contracted kidney. Acute dilatation sometimes occurs in athletes after severe exertion.

Diagnosis.—Percussion shows enlargement of the cardiac area of dulness, apex beat is displaced, heart sounds are weak and may be attended with murmurs.

Treatment.—Removal of the cause. Rest and stimulation where insufficiency is evident.

Hypertrophy of Heart.—Increase of blood-pressure is the cause.

Fatty Heart is a disease of adults, generally due to overeating and lack of exercise. Occurs also in anæmic, debilitated people.

Treatment.—According to cause. Tonics containing iron, in weak, anæmic people; exercise and dieting in plethoric. Prognosis is grave.

MYOCARDITIS is a disease of later life, due to thickening of the coronary arteries and cutting off the blood-supply in the terminal branches.

Symptoms.—Palpitation, irregularity, and weakness of the muscle.

Treatment.—Removal of cause, if produced by the use of tobacco, tea, or alcohol. Otherwise, the same as for cardiac weakness from other causes. This condition is also known as fibroid heart.

VALVULAR HEART DISEASE is sometimes congenital, but is generally acquired. When congenital it is usually right-sided; when acquired, left. It usually follows an infectious disease, particularly rheumatism and scarlet fever. One or several valves may be the seat of the disease, the cause being an inflammation of the endocardium, and the result either a stenosis or narrowing of the orifice of the valve or a thickening and shrinking of the leaflets of the valve, rendering proper closure impossible. Rarely without the valves being affected, their closure may be insufficient from simple dilation.

Anatomic alterations show thickening and contraction of the leaflets of the valves, and projections from their surfaces known as vegetations. Hypertrophy and dilatation coexist, and signs of poor circulation throughout the body are evident. Most commonly the mitral valves are affected. In later life the aortic are more frequently affected, owing to atheromatous changes.

Symptoms.—Valvular heart disease may exist for years without giving rise to much disturbance, and it is only when compensation begins to fail that attention is called to the condition. Palpitation of the heart, shortness of breath on exertion, and fainting attacks are among the early symptoms; later, œdema, beginning

usually in the extremities (feet) and extending generally to the whole body. At this stage a patient is very short of breath, is unable to lie down, and the lungs are full of râles; there may be expectoration of blood and blood-streaked mucus, and the vessels of the neck are seen to pulsate. These symptoms either gradually abate or the patient dies from cardiac failure and exhaustion. This train of symptoms is common to all valvular heart diseases in the terminal stages.

Aortic regurgitation is recognized by the presence of a diastolic murmur at the second right costal cartilage, transmitted down the sternum, with great dilatation and hypertrophy of the left ventricle, and an accelerated, full, hard radial pulse, of trip-hammer type (Corrigan pulse).

In *aortic obstruction or stenosis* there is a systolic murmur at the second right costal cartilage, transmitted into the vessels of the neck. Hypertrophy of the left ventricle is not so marked, and the pulse is slow, retarded, and small. In this condition the patient is often pale and thin and liable to attacks of syncope.

In *mitral insufficiency or regurgitation* a systolic murmur is heard, which is often transmitted to the axilla. It is heard best at the apex. Dilatation and hypertrophy of both ventricles is present. There is nothing typical in the pulse. *Mitral obstruction, or stenosis,* is much more common in women than in men. A presystolic murmur is present at the apex with dilatation and hypertrophy of the right ventricle. Of the right-sided lesions the most frequent is *tricuspid insufficiency,* following as a secondary consequence of diseases of other valves. The murmur of this lesion is systolic in time and heard with greatest intensity at the xiphoid cartilage. There is, in addition, a venous pulse and often pulsation of the liver accompanying this lesion, and the right ventricle is hypertrophied.

Chronic endocarditis with lost compensation. (Rotch.)

Diagnosis of valvular heart disease is made by the presence of a murmur. The question of the valve involved is determined by the location of the murmur, and the nature of the lesion by the time of the murmur. Murmurs in the heart may arise in cases of anæmia, and must be differentiated from organic murmurs. In some cases where the heart is very weak murmurs may be absent and the diagnosis must depend on general symptoms.

Treatment.—For those suffering from valvular heart disease it is important, when compensation is established, to lead a life as free from mental and physical worry as possible; also to eat and drink in moderation; to give up the use of tea, coffee, and tobacco, and generally to lead a careful life and to keep in good physical condition. Particularly is this advice necessary for those suffering from aortic insufficiency, where sudden death often occurs from heart failure without the warning signs of gradual failure of compensation more common in the other forms. High altitudes should be avoided. When compensation fails it may do so abruptly or gradually. The treatment of failing compensation consists in absolute rest and quiet. The restoration of balance of the circulation may be brought about by (1) bleeding, (2) purging, (3) cardiac stimulants,—chiefly digitalis,—and by rest.

Special symptoms.—Dropsy is treated by the use of cardiac stimulants and saline purgatives. Southey's tubes may be inserted in the legs in cases of extreme dropsy and often succeed in draining away very large quantities of fluid. For dyspnœa a bed rest is useful. Tapping of the pleura must be performed if effusion be present. Gastric irritability is often difficult to treat. Solid food should be stopped and some of the following foods and drugs be given a trial: cracked ice, milk and lime-water or an effervescing water, champagne, brandy,

creosote, hydrocyanic acid, and morphia. For sleeplessness Hoffman's anodyne, paraldehyde, and morphia have most popularity. Renal insufficiency may be counteracted by purgatives, diuretics, and by promoting activity of the skin.

Diet.—Fluid should be restricted and in cases where the stomach is unable to digest properly, beef-juice, albumen-water, and milk may be given in small quantities every two or three hours. Later, when the circulation improves, eggs, small quantities of finely chopped beef, and chicken may be cautiously tried. Starchy foods should be avoided. The patient should have a daily sponge in lukewarm or warm water; cold water should never be used, either on the face, hands, or body. The patient should be kept from every kind of excitement, worry, or exertion.

True Angina Pectoris always occurs as a symptom of arteriosclerosis of the base of the aorta and coronary arteries. There are several theories in regard to *the cause* of the pain; (1) that it is due to dilatation of the heart and stretching of the nerves; (2) that ischæmia of the heart muscle is the cause; (3) that it is a neuralgia of the heart. It generally first occurs at forty years of age or upward, and frequently is associated with aortic valvular disease. The immediate causes are excitement, overexertion, and flatulence. The attacks occur at irregular intervals.

Symptoms may be but slight and evanescent or may be severe. The patient may die in the first attack or may live years with many attacks. Paroxysms begin suddenly with intense agony in the heart and with pains radiating to the neck and down the left arm. The patient is pale and silent and filled with a dread of immediate death. Death may occur at the height of the attack, or the patient may faint and die in syncope. The pulse is altered singularly little.

Treatment.—Nitrite of amyl, three to five drops, may be inhaled, and nitroglycerin and potassium iodide administered between attacks. Nitrite of sodium is also useful.

CONGENITAL HEART DISEASES are treated of in the chapter on children's diseases.

ARTERIOSCLEROSIS is a thickening of the inner coat of the arteries secondary to a change in the outer coats.

Etiology.—In the natural course of events arteriosclerosis develops in all old people. Certain things, however, conduce to its beginning early in life, or to its being greater in degree than is normal with a certain age. Alcohol, gout, overeating, syphilis, heredity, and hard, exposing occupations are factors in its early appearance. In some it develops at an early age without any of these causes being obvious, and in such cases we conclude that the arterial tissue is of poor quality to begin with.

Morbid Anatomy.—Changes consist in yellow patches in the aorta which soften and are replaced by hard tissue which may be covered with calcareous plates, thicker than the original lining membrane. Where the disease is general this thickening of the inner layer of the arteries is general, and even extends to the capillaries, seriously inconveniencing function in every organ in the body. In this process the larger arteries become tortuous, hard, and pipe-like to the touch.

Symptoms.—High-tension pulse, hardness of the arteries, hypertrophy of heart, accentuated second sound of heart, cerebral symptoms. Renal involvement also follows inevitably, usually in the form of a slow, chronic nephritis.

Treatment.—All alcohol should be interdicted and hard exercise proscribed. All mental worry and excitement should be avoided. Bowels and kidneys should be kept active. The food should be plain and not too great

in quantity. Potassium iodide should be prescribed when a syphilitic history is given; bleeding or nitroglycerin for the high-tension pulse. The disease being incurable when once begun, treatment should be directed towards preventing its increase, and avoiding serious secondary results such as apoplexy, and uræmia.

ANEURISM is a dilatation of an artery, due to a weakening or rupture of one or more of its coats. It rarely occurs without previous disease of the arteries, especially arteriosclerosis. It is predisposed to by the same causes which produce arteriosclerosis and occurs in men more often than in women, since hard work and strain are exciting causes. Aneurisms are classified according to their shape: (1) fusiform, (2) sacculated, (3) dissecting aneurism; the latter being one where the coats of an artery are torn and the blood-current forces its way between them. The most common seat of aneurism is in the thoracic aorta.

The *symptoms* of aneurism are dependent upon the pressure on structures in their neighborhood. They may be latent, as is often the case in those situated at or near the beginning of the aorta. In thoracic aneurism growing forward, the sternum and ribs may be eroded and the presence of a pulsating tumor of the chest be evident in the back through the vertebræ and ribs. In some situations the superior vena cava may be pressed upon, giving rise to swelling of the head and arm. Pressure on the sympathetic nerves gives rise to alterations in the pupils. Cough is produced by pressure on the bronchi or trachea or on the recurrent laryngeal nerve.

Hemorrhage may occur from a rupture of the aneurism, and may be external or internal according to the locality of the aneurism, and also may be large or small and gradual according to the size and nature of the rupture of the sac. Inequality of the pupils may be present and is due to pressure on one or other side of the

sympathetic system. Similar pressure may produce unilateral sweating. Inequality of the radial pulse affords a clue to the situation of the aneurism in the thoracic aorta. Difficulty in swallowing is usually due to pressure on the œsophagus.

Tracheal tugging is present in some cases, and is felt during the expansion of the aneurism when the left bronchus is pressed down. This sign may be elicited by taking firm hold of the thyroid cartilage and maintaining it for several heart-beats. Pain is often present and is usually due to pressure. When the vertebræ are eroded and the aneurism presses on the spinal cord, great pain results, and oftentimes paralysis.

Physical signs.—On inspection, occasionally a localized expansile pulsation may be noted. Rarely is a tumor present. On palpation sometimes an expansile pulsation may be felt, and over this pulsating area a systolic thrill. Percussion yields a dull note defining the outlines of the tumor, and auscultation should supply the remaining link necessary to the diagnosis,—namely, the loud, harsh, systolic murmur, known as the aneurismal bruit. In many cases of thoracic aneurism most of these physical signs may be absent. Unless the ribs be eroded there will be no tumor evident nor palpable; if the aneurism be small and posteriorly situated no area of dulness may be made out, and frequently there is no murmur audible at all. However, there are usually present some one of the physical signs or symptoms which may aid in arriving at a diagnosis.

Prognosis is very grave in thoracic and abdominal aneurism, less so in aneurism of the vessels of the extremities.

Surgical treatment.—Introduction of silver and gold wires, and horse-hair, into the sac when this is superficially situated. Ligation of vessels other than the aorta. Potassium iodide, gelatin, and morphia internally.

The sac has been punctured with needles and an electric current thereby introduced with the object of forming a clot.

Treatment.—The healing of an aneurism can take place only by the formation of organized clots which form within the sac and strengthen the walls. All treatment is directed towards furthering this end. Absolute rest in bed and dry diet are sometimes of service in sacculated aneurism.

INTOXICATIONS

ALCOHOLISM in the acute form is well known to all as ordinary drunkenness. The chronic form affects particularly the nervous system. There is incoördination and tremor of the muscles, mental depression and forgetfulness, loss of concentration of thought, particularly when the stimulation has worn off. Multiple neuritis frequently develops, and is commonly very painful; digestion is impaired and vomiting is common, especially in the morning. A condition of gastric and intestinal catarrh is present. Cirrhosis of the liver is a very common condition in chronic alcoholics and changes occur in the blood-vessels, leading to kidney disease and heart disease.

Delirium tremens occurs in chronic drinkers after an unusual amount of drinking or following a shock or accident, or after suddenly withdrawing alcohol. It is characterized by a wakeful, busy delirium, during which the patient sees all kinds of repulsive and loathsome animals, and is haunted by terror of their approach. Fever may be present, digestion greatly disturbed, and wakefulness so prolonged that a fatal exhaustion ensues. Usually this fatal issue is aided by the presence of some kidney disease, a result of chronic irritation from the alcohol. Treatment of delirium tremens consists in the application of straps to the patient's legs and arms to

prevent injury to others or to himself. Sedatives are given to quiet the delirium and promote sleep. Hyoscine and bromides are most useful. Morphia is dangerous. Stimulants may be necessary if exhaustion shows itself, and even whiskey may sometimes be given, though this should usually only be done before the attack with the hope of warding it off.

Prognosis.—Steady drinkers rarely give up the habit, and consequently the prognosis is grave. It is influenced by age and the quantity of food taken. Those who eat heavily as well as drink much usually die earlier than those who take but little food.

Periodical drinkers or dipsomaniacs generally die in one of their sprees or not infrequently commit suicide.

Treatment is best conducted in an institution, and the patient should remain there for at least one year. Shorter periods of abstention have proved useless in effecting a permanent cure of the habit. Periodical drinkers nearly always relapse. Acute alcoholism needs little treatment. The stomach may be washed out. Apomorphia, one-sixth to one-eighth grain, hypodermically given to provoke emesis, and liquor ammoniæ acetatis, wineglassful every fifteen minutes until three or four doses are taken.

Treatment of chronic alcoholism consists in confinement to an institution, bitter tonics, bromides, chloral, and opium for restlessness and sleeplessness; and moral support. While few cases ever really abandon the drinking habit, yet hope should never be given up in any individual case.

Morphia Habit.—This habit is common in the East as opium smoking. In this country opium or its alkaloid, morphia, is more commonly taken internally or by hypodermic injection. The habit is generally begun by innocently using morphia to relieve neuralgic pain. Patient, nurse, or physician should never administer mor-

phia hypodermically to themselves. In the case of neurotic women the drug should be most carefully given and the knowledge of its identity concealed. When the habit is once established it is most difficult to get rid of, and no reliance can be placed on the word of a morphia-fiend in regard to the amount taken. As the habit continues it is generally necessary to increase the dose in order to obtain the desired effect. This effect is a stimulation of mind and a feeling of well being, with wakeful dreams.

In those accustomed to its use morphia does not produce sleep, as is commonly supposed.

Symptoms depend on the amount taken and the length of time of the habit. There is irritability and restlessness and itching of the skin, mental depression between doses, and pain in the stomach. Digestion is disturbed. Pupils are dilated except when a dose has recently been taken, when they are contracted. The habit often ends in death from general weakness and debility.

Treatment should, like that of chronic alcoholism, be carried on in an institution. Gradual withdrawal of the drug should be persisted in until none is any longer taken. Stimulants and somnifacients, such as sulfonal, paraldehyde, bromides, and hyoscine are necessary to quiet the nerves and produce sleep. Sometimes diarrhœa develops, and treatment for this condition becomes necessary. Astringents, such as bismuth, lead acetate, and chalk-mixture, may be given.

Lead Poisoning is common among painters and lead workers of all sorts. It may occur through the lungs, gastro-intestinal tract, or skin. It may be acute or chronic.

The acute form is characterized by rapid anæmia, vomiting, nephritis, and diarrhœa.

Chronic lead poisoning occurs in three forms,—most commonly (1) lead colic, (2) palsy, and (3) encepha-

lopathy. Colic is commonly associated with constipation. The pain is not continuous, and diarrhœa sometimes alternates with constipation. The paralysis often attacks the musculospiral nerve, causing wrist-drop. It may, however, affect a whole limb or even the whole muscular system. Prophylactic precautions should be taken by the worker in lead to prevent the development of this poisoning. Thus the hands should be thoroughly washed and the nails cleaned before food is taken, or, indeed, before taking a chew of tobacco or smoking a pipe. Where men are employed to work in the fumes of lead a protective cage is provided to prevent inhalation.

For the treatment of the attack itself magnesium sulphate should be given daily, iodide of potassium to absorb the lead and set it free from the tissues, and morphia for the pain. For the palsies, electricity and massage are useful. Iodide of potassium should be given in small doses at first, as decided harm often results from large doses.

Encephalopathy may affect the meninges, optic nerves, and brain itself. There may be delirium, convulsions and coma, hallucinations and maniacal excitement.

The prognosis is bad in the cerebral forms; good in other cases.

HEAT-STROKE.

There are two kinds, heat-exhaustion and sunstroke proper.

HEAT-EXHAUSTION occurs in hot weather or in hot rooms independently of exposure to the sun. In this condition the patient is weak, the extremities are cold, the pulse is weak and rapid, and unconsciousness may occur. The temperature is subnormal.

Treatment consists in stimulation and application of heat to the extremities and to the whole body if necessary.

SUNSTROKE proper usually occurs after exposure to the sun in hot weather, and is especially liable to attack alcoholics. It comes on suddenly with dizziness, sense of oppression in the head, headache, and a feeling of great heat. Soon the patient becomes unconscious and the breathing stertorous, petechiæ appear and the temperature ranges from 106° to 112° F. Unless this condition be speedily relieved death will quickly follow.

Treatment consists in lowering the temperature by means of cold baths, frictions with ice, and cold affusions. Most success has been met with by combining vigorous friction with the cold water or by pouring the cold water on the body from a height. Bleeding is advisable under some circumstances.

After-effects of sunstroke are very distressing. Sometimes a slow meningitis develops, which may eventually prove fatal. Chronic headache may result and inability to stand hot weather or exposure to the sun without feeling weak and dizzy.

CHAPTER XIII

Care of Children and Diseases of Children: General Considerations, Objective Signs and Symptoms, Study of Excretions, Dentition, Diet, Artificial Feeding, Bathing, Sleep and Exercise—Diseases of the Mouth and Naso-Pharynx: Stomatitis, Catarrhal, Aphthous, Ulcerative, Parasitic and Gangrenous; Adenoid Growths—Diseases of the Digestive System: Constipation, Vomiting, Colic, Cholera Infantum, Entero-Colitis, Intestinal Worms—Constitutional Diseases: Rickets, Scurvy, Cretinism—Diseases of the Nervous System: Cerebral and Spinal Paralyses of Children, Night Terrors, Laryngismus Stridulus, Chorea, Enuresis—Diseases of the Heart: Congenital Lesions, Intussusception, Icterus Neonatorum Melæna—Peculiarities of the Pulse and Respiration of Infants—Mouth-washes—Sleeping Potions.

CARE OF CHILDREN

General Considerations.—Certain diseases are more prone to attack individuals at certain ages, and are thus classified either as senile or infantile as the case may be. Thus, those past adult life are rarely attacked by the contagious diseases, these being mainly confined to the childhood period. Whereas such diseases as aneurism, arteriosclerosis, and many nervous diseases rarely occur until past middle life. Very young babies usually escape contagious diseases even when exposed. Children react to disease in a different manner from adults, and are more susceptible to slight disturbances. Thus, a child will sometimes have a temperature of 104° to 105° F. in answer to some minor disturbance, such as headache or indigestion, which might not affect the adult

temperature at all. Very weak marasmic infants may reverse this rule, and be very ill of some, perhaps fatal, sickness and give but slight indication of it through the temperature. This is also possible in the very old. The study of disease in children differs from that of adults also in that the child can either give no history at all of its symptoms, or only one that cannot be valuable, and thus objective signs and symptoms are our only help in approaching a diagnosis.

Children of the poor, in the slums, especially in summer-time, rarely look healthy and often look extremely ill, though in reality suffering from some trivial complaint, and it is surprising what a difference a few days at a sanitarium, plus the addition of soap properly applied and cheerful surroundings, will make. Amusement is a great factor in both physical and mental health, and particularly so in the case of children.

At birth a child usually weighs from six to ten pounds and is about sixteen inches long. The daily increase of weight is from one-fourth to three-fourths of an ounce, and it grows from five to six and a half inches in the first year. In the second year the child increases two and two-thirds to three and one-third inches in length, and maintains about the same ratio of increase until the fifth year. From then to the sixteenth year growth takes place at the rate of from one and a half to two inches a year. Frequently about the fourteenth or fifteenth year there is an extra amount of growth, reaching at times four or five inches in that one year. At eight months of age the baby begins to sit erect, and at fourteen months the child should walk alone, though this ability varies very much. Delay in learning to walk may be because of rhachitis or infantile paralysis or because the baby has had rather more than its share of the ailments of infancy.

Between the fifteenth and the twentieth month the

anterior fontanelle should be closed and ossified. Failure or delay in closing of the fontanelle is a symptom of rhachitis. In the observation of children there are certain data that can be learned by noticing their expression, posture, and other objective phenomena. A child has not the control of itself that an adult has, and therefore very often it quite accurately reflects, either by attitude or expression, the nature and seat of its trouble.

Thus a wrinkling of the forehead may indicate headache. The nostrils are dilated in pneumonia or when breathing is difficult. The upper lip is drawn up in abdominal pain.

In wasting diseases of intestinal nature, such as summer diarrhœa or cholera infantum, the skin becomes sallow, eyelids blueish, eyes sunken, and but half closed during sleep, the fontanelle depressed, and the body emaciated.

The cry of a child is sometimes diagnostic in itself, and usually something can be learned by observing it. A sudden outcry at night may be indicative of hip-joint disease, meningitis, or hydrocephalus. The cry of colic is continuous and loud, and the child writhes and twists its body at the same time.

In earache the child cries and moans and holds its aching ear pressed against the mother's breast.

In diphtheria, when the throat is very bad, the child generally lies still and saves all its energies for the act of breathing, which is so often performed with difficulty in this disease.

The same is true both of conditions of exhaustion and in pneumonia, where much pain accompanies the act of breathing. A hoarse cry in an infant indicates a laryngitis, possibly due to inherited syphilis.

The posture of a child is usually lateral. If a child is much exhausted it lies continuously on its back. In meningitis the head is retracted, possibly also the legs

will be drawn up and the abdomen retracted. A child with colic will lie on its abdomen.

Physical examination of children should be made with all their clothes removed, as should be also done with adults, except for the natural objection on the score of modesty. A rhachitic child has a square head, a chest in which the ribs flare out towards the base, and has beaded prominences where the ribs and costal cartilages join, known as the rhachitic rosary.

Tuberculosis is very apt to attack the hip-joint and spinal column in early childhood, and evidences of it may be visible to the eye. The miserable little victims of hereditary syphilis are small at birth, with the skin wrinkled and loose, while later on they develop fissures (rhagades) about the mouth and arms. A nurse handling such a child runs great risk of becoming infected.

EXCRETA.—*Urine.*—The quantity passed by infants cannot be accurately gauged. The diaper may have to be changed every hour or so, or maybe not for eight or ten hours; if not for twelve, the cause of the anuria should be searched for. After three years of age, the child voids urine six or eight times a day when awake and once at night. Wetting the bed at that age is pathological. The urine in health wets but does not stain.

The amount of urine voided daily by a healthy child is as follows: two to five years, from fifteen to twenty-five ounces; five to nine years, twenty-five to thirty-five ounces; nine to fourteen years, thirty-five to forty ounces.

Fecal Evacuations.—The number varies with the age of the child. During the first six weeks there are three or four a day, which look like thick soup, yellowish white or orange in color, and of a faintly fecal and slightly sour odor. From the sixth week to the end of the second year there should be two movements a day, which are mushy and not well formed, brownish yellow in color,

and have a fecal odor. After the second year, when first dentition has been completed, the movements assume the characteristics of the adult stool.

Certain characteristic changes in the stools occur in pathological conditions. When the food is not properly digested the movements will be semi-liquid, containing white, cheesy lumps and curds. Intestinal catarrh causes scanty scybalous stools, brown or blackish, mixed with mucus. When there is deficiency of biliary secretion, generally seen in infants as the result of catarrhal inflammation of the bile-ducts, the stools are whitish or clay colored.

When the stools contain blood and mucus, dysentery or tubercular disease of the intestine and typhoid fever must be considered. Diarrhœa in sucklings causes the stools to smell very sour. Ova or segments of worms indicate intestinal parasites.

Dentition.—One of the most trying epochs in the existence of all of us, happily forgotten as we grow older, is the first dentition. This is the term applied to the cutting of the milk-teeth, which commences usually at the seventh month, and continues until the end of the second year. The teeth usually appear as follows: lower central incisors, upper central incisors, upper lateral incisors, lower lateral incisors, first molars, canines, back molars. At twelve months the infant should have cut eight teeth. During the actual cutting of the teeth the local irritation is such as to throw the child's susceptible nervous system off its balance and render it very liable to digestive disturbances or serious nervous manifestations, frequently convulsions. It renders it more susceptible to attacks of disease, such as pneumonia, and causes the manifestations of such disease to be more severe than usual. Much relief is given to the child when teething by rubbing the gums; sometimes putting a little lemon-juice on some soft linen and rubbing gently will lessen

the congestion and pain. For this purpose also rubber rings are sold for the baby to chew on.

The appearance of the teeth is delayed in poorly nourished, marasmic, or rhachitic children. The permanent teeth begin to make their appearance in the sixth year. The appearance of the toothless children of five or six years, when they are losing their first teeth and the second set have not appeared, is familiar to all.

The first teeth should never be pulled unless by an expert dentist, because of the danger of producing periostitis and preventing eruption of the second set.

DIET.—The feeding of infants has much to do with their health and illnesses. There are three ways: (1) nursing by the mother, (2) by a wet-nurse, (3) artificial feeding. The first is the natural and best way. The child should be nourished solely from the breast up to the eighth month and partially for the rest of the first year. The child should be put to the breast as soon as the mother has somewhat recovered from the exhaustion incident to her labor,—from four to eight hours after birth. The mother's first milk is scanty, consisting chiefly of colostrum, which is not very nourishing, but is distinctly laxative, and thus serves to cleanse out the baby's intestinal tract. The child should be put to the breast every two hours while the mother is awake. Until the end of the sixth week every two hours, then the interval should be increased until by the fourth month it is every three hours of the waking day. Feeding should never be practiced for pacifying purposes. After the eighth month mixed feeding by adding a bottle to the breast food may be begun. By the end of the twelfth month the baby should be weaned completely. Physicians always direct weaning by prescribing specially prepared milks.

A wet-nurse must first be thoroughly questioned by the physician and examined to make sure that she is per-

fectly healthy, particularly as to being free from tubercular or syphilitic disease.

Artificial feeding may, for one reason or another, become necessary either at the birth of a child or at a later period. In artificial feeding the object is so to modify cow's milk as to make it as nearly as possible similar to mother's milk. Cow's milk differs from human milk in several particulars, thus:

HUMAN MILK	COW'S MILK
Reaction, slightly alkaline	Slightly acid
Specific gravity, 1028–1034	1032
Water, 87–88 per cent.	86–87 per cent.
Fat, 3–4 per cent.	4 per cent.
Milk sugar, 6–7 per cent.	4.50 per cent.
Total proteids, 1–2 per cent.	3.50 per cent.
Caseinogen, .59 per cent.	2.88 per cent.

—*Rotch.*

Thus it will be seen that the cow's milk differs from human milk in that it is acid and contains a much higher percentage of proteids while it is much lower in sugar. Simple alkalinization and dilution of the cow's milk, while it might reduce the percentage of proteids to the proper amount, would yet leave the mixture weak in the nutritive properties of the fats and sugar. In order, therefore, to control the various percentages, we take cream of known fat and proteid percentage, dilute it, and render it alkaline, and then add milk sugar and fat-free milk to raise the proteid percentage. The whole is then pasteurized and sealed in bottles. This process is known as milk modification, and is carried on in the Walker-Gordon milk laboratories according to the prescriptions of physicians. The advantages of the careful study of these conditions are very great, for not only can mothers' milk be closely imitated, but also in the

event of the mother's milk not agreeing with the child, changes in one or other ingredient of milk may be made in the laboratory and a very satisfactory result obtained. Condensed milk is thought very highly of by many mothers, and certainly some children do very well on it.

The objection to the artificial foods lies in their large content of starch, which a young baby is totally unable to digest. After a baby has reached its tenth month a little starchy food may be judiciously added to the diet, as at that age the development of the organs of digestion reaches the stage where starch digestion takes place. Pasteurization of milk is accomplished by heating it to 158° F. and maintaining that temperature for one-half hour. Bacteria are destroyed by such a temperature, though the spores are not.

Tyndall suggested a modification of this method which bears his name (Tyndallization). It consists of heating the milk for a short time to a few points below boiling, then, after allowing it to cool, repeating the process, with the result that whatever bacteria have developed from spores in the interval will be killed by the second or third boiling.

Where it is necessary to use a bottle for the feeding, the greatest cleanliness is imperative. At least two bottles should be kept on hand, and while one is in use the other should be kept full of water with a teaspoonful of bicarbonate of soda added. After each feeding the bottle should be washed out with boiling water and left standing containing the bicarbonate of soda and water. Before being again used the bottle should be thoroughly washed in cold water. The nipples should be everted and washed thoroughly either with a brush or soft cloth and kept in cold water until next needed.

The construction of the feeding apparatus should be as simple as possible in order to make absolute cleanliness easy, and for this reason long rubber tubes or un-

necessary bone or wire connections are to be condemned.

BATHING.—During the first two and one-half years the child should be bathed every day. The bath must be given at a regular time, the best time being in the morning, midway between the two meals, at 10 A.M. The bath should be given in a warm room near a fire and away from currents of air. The temperature of the bath should be 95° F., and the water should be in sufficient quantity to cover the child up to the neck. After undressing, the child's head should be wetted, and the body should be then plunged into the water and thoroughly washed with a soft rag or sponge, using pure unscented castile soap. After remaining in the water for from three to five minutes, the body should be well dried with a flannel cloth or soft towel, and enveloped in a light blanket and the child returned to the crib to sleep, or held in the lap ten or fifteen minutes to get rested before putting on the clothes. In very hot weather sponging with water of a temperature of 90° F. twice daily may be practiced.

CLOTHING.—Infants have but little power to resist cold, hence there is a great necessity of warm clothing. Most physicians condemn absolutely the practice of trying to harden children by leaving their legs and knees bare and sending them out in all kinds of weather. This should only be done in hot weather. Otherwise the whole body should be encased in woollen underclothing, varying in thickness with the season. All garments must fit loosely. The winter night-dress should be of flannel or canton flannel in the form of a long plain slip with a draw-string at the bottom to prevent exposure of feet and limbs. In summer it may be made of muslin. A flannel under-vest should always be worn at night; light gauze in summer, heavier wool in winter. In infants under a year old a broad flannel abdominal bandage, extending from hips to thorax, or, better still, a knitted

worsted band shaped to fit the form should be worn. Such a band or binder keeps the viscera warm, aids digestion, and prevents colic. Shoes should be large, well-shaped, of soft leather with pliable soles, so as to allow the feet to grow freely. When dressing a child to take it out, the external clothing should be put on just before going out and removed immediately upon return.

SLEEP.—For some time after birth a child passes all its time, except when feeding, washing, and dressing, in sleep—about eighteen out of twenty-four hours. The time necessary for sleep gradually decreases, until by two years thirteen hours is all that is required, and at three years but eleven hours.

EXERCISE.—A child begins to use the muscles before creeping or walking. It should be allowed to lie on its back and kick freely for exercise. At nine or ten months the child begins to creep, and at the end of a year he will try to stand, and from four to eight months later will be able to walk by himself. Children vary greatly, however, in this ability, and a delay of a few months is nothing unusual. To get fresh air and sunlight the child should be taken out of doors every day, weather permitting, after the age of one month in summer, or of four months if born in the fall or winter. In cool weather babies unable to walk are taken out in a coach or the nurse's arms for an hour in the morning and for one-half hour in the afternoon while the sun is shining. In summer they may pass nearly the whole day in the open air, but should be protected from the direct rays of the sun. Until well advanced in childhood they should not go out of doors in damp, rainy weather, or when a stormy eastern or northeastern wind blows, or when the thermometer is below 15° F.

DISEASES OF THE MOUTH AND NASO-PHARYNX

STOMATITIS, or inflammation of the mouth, is a disease

common in infancy and childhood, and occurs in several forms,—viz., catarrhal, aphthous, ulcerative, parasitic, and gangrenous.

In *catarrhal stomatitis* the lips and buccal mucous membrane are red, swollen, hot and dry at first, while later on the mouth is saturated with acid hypersecretion. Sometimes the mucous glands of the cheek stand out prominently as pearly white spots, and the papillæ of the tongue are elevated and very red. This condition usually lasts from a day or so to a week, and is caused by bad hygiene, the use of irritating food or unclean utensils, teething and certain drugs, such as mercury. The treatment consists in the use of mild antiseptic mouth-washes, such as boracic acid, very dilute listerine, or potassium chlorate, after removing the exciting cause, if possible.

Aphthous stomatitis is characterized by the appearance of white spots on the tongue and cheeks. These white spots cannot be readily removed, and bleeding usually follows such attempts. Occasionally several aphthæ coalesce and produce one large spot. The cause is probably an infection of some kind and may be brought about by uncleanliness. The treatment is similar to that of simple stomatitis with this difference, that in the event of the aphthæ persisting it may become necessary to touch them with solutions of silver nitrate or copper sulphate.

Ulcerative stomatitis occurs occasionally in epidemics, and is often observed at the time of the second dentition. It is probably of infective origin, though it may also be caused by mercury or bismuth. The ulcers usually appear first on the lower gums, then on the upper, and finally may spread all over the mouth. The breath at this stage is heavy and offensive, eating is difficult, and constitutional symptoms are present. Active antiseptic measures should be employed locally as in the other

forms of stomatitis. Internally potassium chlorate may be used in moderate doses.

Thrush, or parasitic stomatitis, appears on the tongue, cheeks, and palate in the form of whitish patches implanted on an inflamed mucous membrane. This disease is produced directly by a vegetable parasite or fungus called saccharomyces albicans, and indirectly by uncleanliness of nursing bottles and of the mouth. The disease usually attacks weak, feeble, bottle-fed children, and at times in such subjects is serious, though, as a rule, a mild disease. In the severe form the mouth may be red and swollen and well covered with white patches; there may be grave vomiting and diarrhœa, and the child may rapidly die of exhaustion. In adults the disease is usually secondary to some other depressing condition, and is in this respect of grave significance.

Preventive treatment consists in cleansing the mouth after each nursing with cold water, and the proper care of rubber nipples and the bottle as a whole. After development the spots should be touched with boric acid solution and the mouth frequently cleansed with the same, and internal remedies of a supporting kind, such as iron, quinine, arsenic, brandy, and strychnia, should also be administered.

Noma, or gangrenous stomatitis, is usually secondary to one or other of the infectious diseases. It begins as a small patch of gangrene in the mucous membrane of the cheek, which rapidly spreads until the whole cheek is involved. Externally there is early evidence of the condition shown by the presence of induration, swelling, and œdema of the cheek. As the gangrene progresses the tissues break down, the whole side of the face may be laid bare, the teeth drop out, and the child sinks into a condition of stupor, to be soon followed by death. The odor of the gangrenous parts is most offensive and the discharge irritating to the neighboring healthy tissue.

Stomatitis gangrenosa, or noma. (Rotch.)

Facies of case of adenoids. (Rotch.)

Noma is usually fatal and fortunately rare. The ulcer resulting from the gangrene should be cauterized with fuming nitric acid or with the actual cautery, the mouth frequently washed with antiseptic mouth-washes, and the general strength of the little patient supported with tonics and stimulants. When the tissue breaks down, washes and dressings of deodorant character, such as potassium permanganate and carbolic acid, may be applied, and iodoform powder dusted on the surfaces.

NASO-PHARYNX; ADENOIDS.—Adenoid growths in children occur usually in the naso-pharynx, and occlude the channels of breathing to such an extent as to cause mouth-breathing, deformity of the face and chest, and mental deficiency. The existence of adenoids may be suspected from the symptoms above mentioned, and earlier from the nasal character of the voice and frequent hawking up of a catarrhal and sometimes blood-streaked mucus.

The diagnosis is made either by digital or rhinoscopic examination.

Treatment is surgical and consists of removal either with a curette or the finger-nail.

DISEASES OF THE DIGESTIVE SYSTEM

CONSTIPATION is said to exist when the bowel movements are either insufficient in quantity or abnormally infrequent. Usually, also, such movements *are hard* and *dry*.

The causes and treatment of constipation vary according to the age of the child, and it is better to study the subject from two aspects,—namely, the constipation of infants and that of young children. In infants constipation may be quite marked and due either to general or local causes. Thus, it may be constitutional and have relation to general weakness of the muscular system

caused by such diseases as rickets or congenital syphilis. Very commonly constipation is due to a milk too rich in proteids, whether this milk be given at the breast or by bottle. Sterilized milk is often harmful. In breast-fed children, if proper regulation of the mother's diet and exercise does not effect the desired result of increasing the relative amount of fat in her milk, a small amount of cream may be administered after each nursing. Massage of the abdomen, particularly kneading movements, are valuable, and finally drugs may be resorted to, but should be given with the idea of restoring the torpid function in as short a time as possible, and then discontinued. Cascara sagrada, sodium phosphate, and magnesium sulphate are used, as are also podophylin and aloes.

In older children constipation may be cured by regulation of the diet, by exercise, by cultivating a regular habit in regard to the time of going to the closet, whether the movement seems necessary or not, and by judicious use of drugs. Excessive exercise, accompanied by free sweating, nearly always increases constipation in one already so affected. Too much consideration of the subject and its attendant ills exerts an inhibitory influence on the bowels. In those disposed to worry and grow despondent from the existence of constipation it is well in giving advice to minimize the bad effects of the condition and to make the most cheerful prognosis possible.

Vomiting occurs in babies and young children from very slight causes. In nursing babies regurgitation of milk a short time after nursing indicates that the child is being overfed, and the mother should regulate this by lessening the time of nursing. If, after careful regulation in this particular, the vomiting continue and other digestive disturbances manifest themselves (such as diarrhœa, passing of curded milk, and colic), it may then become necessary to examine the mother's milk and determine the percentage of the food products. Older chil-

Stomach of infant 2½ days old Natural size (Rotch)

dren vomit from overeating, from violent exercise after a heavy meal, and from a variety of other causes.

Forcible or projectile vomiting suggests some brain trouble and should always be regarded seriously. Vomiting accompanied by pain may be due to simple indigestion, colic, poisoning, or to some obstruction of the bowel or intussusception.

COLIC may be either abdominal or renal, but is more commonly abdominal. It is due to spasm of the muscular coat of the intestine, and usually accompanies a flatulent indigestion. Vomiting may or may not be present, but the abdomen is usually distended and tense.

Treatment consists in application of warmth to the belly, administration of from five to ten drops of whiskey, gin, or brandy and hot water, and in some cases the giving of an enema. The flatulence which sometimes precedes the actual colic may be controlled by soda mint, asafœtida, or Hoffman's anodyne.

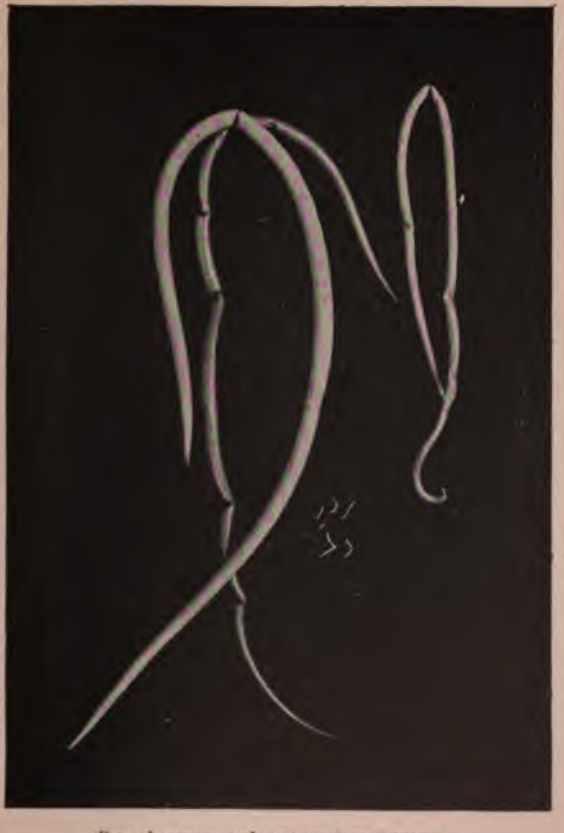
CHOLERA INFANTUM (CHOLERA MORBUS).—A disease characterized by inflammation of the gastro-intestinal tract occurring during the summer months exclusively. The attack may begin very suddenly with violent vomiting and profuse diarrhœa, or these symptoms may come on after a milder state of diarrhœa has been present for the previous two or three days. The vomit is at first composed of undigested food, later of mucus and bile, while the intestinal discharges, at first fecal in character, soon become watery and serous, and may even be similar to the typical rice-water-like stools of Asiatic cholera. If the attack is severe the vomiting and purging increase, the child is unable to retain anything in the stomach, the eyes become sunken, the extremities cold, and the picture is that of the algid state of Asiatic cholera. The temperature by rectum is elevated, despite the cool surface and extremities. This condition is either very rapidly fatal or the symptoms gradually abate and the child

vomits and purges less and less until recovery is established. The mortality is very high, particularly in weak, rhachitic children in crowded city districts.

Treatment consists in the administration of opium in some form. In small infants one or two drops of laudanum, repeated at intervals, gives good results. In the event of collapse, hot mustard baths or a hot pack should be given, hot water and brandy internally, and for nourishment cold milk in small quantities. Should the disease assume a subacute type, removal to the sea-shore will sometimes prove of benefit, though, as a general rule, the sea-side resorts are by no means as healthful for children as is popularly supposed to be the case.

ENTEROCOLITIS is an inflammation of the lower part of the small and the upper part of the large intestine, occurring in summer-time and characterized by vomiting, diarrhœa, and distended, tender abdomen. The cause, which is probably of bacterial nature, is unknown, but the disease is predisposed to by overcrowding, poor food, and bad hygienic conditions, and by any of the causes of ordinary diarrhœa in children. The stools are very frequent in number, at first fecal in character, then green, with mucus and perhaps blood. The child rapidly loses flesh and strength, the temperature is elevated, the pulse weak, and the urine small in quantity. The prognosis is bad in weak children situated in a crowded city during a spell of hot weather, and even at best the outlook is serious, as this disease may run into, or rather become, cholera infantum or dysentery. Pathologic changes are found in the glands of the ileum and colon, and in severe cases ulcers may be present.

Treatment.—The diet should be restricted to chicken or beef broth, and milk should be temporarily withdrawn. Castor oil or calomel in divided doses should be ordered and followed by an enema at about the time that the oil or calomel should prove active.



Round worms and seat or thread worms.

Subsequent to cleaning out the bowels, bismuth, opium, tannic acid, or beta-naphthol may be exhibited, the opium often being best administered in the form of laudanum in enemata with starch-water.

It is important to remove the child to the sea-shore or country if under bad hygienic surroundings.

INTESTINAL WORMS in children are of several kinds,—*tapeworms*, ascaris lumbricoides or round worms, oxyuris vermicularis or seat-worms.

There are three principal varieties of the tapeworm, but, as two alone occur at all commonly in this country, a description of the third variety—the bothriocephalus latus—will be omitted.

The *tænia mediocanellata* (or saginata) is transplanted to man by means of beef affected with the larvæ or cysticerci of this worm. As thorough cooking will destroy these cysticerci, it will easily be seen that the parasite is only conveyed to those who eat either raw or but partially cooked meat.

The life history of the worm consists of a vicious circle from man to cow and back again to man. Thus the cow eats the ova of worms extruded from man, which ova develop in the cow's stomach into embryos provided with several pairs of hooklets with which to bore and tear their way into the muscular tissues of their host, where, having become encysted, they exist as cysticerci or, in common parlance, measles. Thus we speak of measly meat or pork, as the case may be. Now, if this measly meat be eaten when insufficiently cooked, these cysticerci find their way into the stomach where the capsule in which they are contained is dissolved by the gastric juice, and the head of the worm attaches itself to the small intestine and begins rapidly to grow. In three to four months, segments of the worm will be passed in the stools. This worm is the one most commonly met with in this country because raw beef is more commonly eaten

than raw pork. It ranges in length from twelve to twenty-four feet, and consists of numerous segments, each one of which is hermaphroditic and contains sets of sexual organs of both sexes, each set being capable of producing eggs.

Tænia solium has a similar life history, except that the host is the hog instead of the cow. The worm is not so long, attaining a growth of but six to twelve feet. There are differences in the head and segments also.

The symptoms produced by tapeworm are vague and ill defined. In some instances no symptoms whatever are present. One worm alone is usually present; rarely two may exist in one case, and the symptoms would in such an event be more pronounced. Symptoms of indigestion, itching of the nose and anus, inordinate appetite, restlessness in sleep, convulsions, picking of nose, and a variety of others have been ascribed to the presence of worms, but as a matter of fact these symptoms generally substantiate the diagnosis in retrospect after segments of worm have been found in the movements.

Treatment consists in starving the patient and the worm for a period of at least twelve hours; a purgative should then be administered, and after it has been operative the vermifuge should be given. Oleoresin of male fern, one-half fluidounce for children of six, Tanret's pelletierine (pomegranate) in doses of one-half that for an adult for children from nine to twelve, pumpkin-seeds ground up and mixed with milk and sugar (Tyson speaks very favorably of koosso), are the ones most commonly used. After any one of these remedies is given, a second purge should follow, and the segments of the worm must be kept carefully for the physician to examine and determine if the head has been brought away. If it is not found, the result of the treatment remains in doubt until several weeks have passed, when it is time again for segments of the worm to appear in the evacuations. As

long as the head is retained the worm will continue to reproduce itself.

Ascaris lumbricoides, the common round worm, inhabits the upper part of the small intestine. The male is from four to eight inches long and the female six to ten. The method of infection is uncertain, but probably the eggs are carried to the intestine with food or water. Symptoms may be absent or of a reflex nature. As a rule, the presence of worms is unsuspected until one or more is passed by rectum. Rarely, round worms may be vomited, and even intestinal obstruction has resulted from knots of them gathering in the bowel.

Treatment.—The best vermifuge for these worms is santonin, given, as a rule, in combination with calomel. From one-fourth to one-half a grain may be administered twice daily until the bowels are freely moved or the worms expelled.

Oxyuris vermicularis, or thread worm (seat-worm), lives in the colon and rectum of children, rarely of adults. The female worm is one-fourth to one-half inch long, the male being smaller. The mode of infection, like that of the lumbricoid worm, is uncertain. Unripe fruit and vegetables are supposed to carry the ova.

Symptoms consist of intense itching of the anus, sleeplessness, and even convulsions. Eczema about the anus may develop from constant scratching. Autoinfection may keep up the trouble, the child carrying the ova to the mouth under the finger-nails.

Treatment consists in the use of enemata of salt and water or of infusion of quassia, repeated daily, until a cure is effected. Often internal medication is also necessary. Santonin and tonics may be given.

CONSTITUTIONAL DISEASES

RICKETS is a disease of childhood characterized by changes in the skull, long bones, and ribs. The disease

usually appears after the first six months of life, though it may exist in utero and at birth.

The causes of rickets are poor diet, bad hygienic surroundings, and existing syphilis, alcoholism, and ill health in the parent at the time of conception. Bottle-fed children are more often affected than others. The changes are for the most part in the bones and consist in flattening of the top and back of the head, making it square in shape, the formation of nodules at the junction of the costal cartilage and ribs, and at the wrist and ankles particularly. There are also changes in the chemistry of the bones which render them softer and more prone to bend, thus producing the well-known deformities of bow-legs and chicken-breast.

Symptoms.—At first the child sweats freely about the head and neck, there is fever and indigestion, weakness, delay in cutting teeth and in walking, and sometimes a general bodily tenderness. Also symptoms of indigestion are usually present, and bronchitis or pneumonia may develop.

Treatment is preventive and curative. Preventive treatment should begin with the mother, and care should be taken that she receives good, wholesome food and lives hygienically. As far as the child is concerned, milk containing sufficient quantity of fat and proteids must be given, and fresh air and sunlight be supplied plentifully. After the disease has developed the diet should be most carefully attended to. Plenty of milk and eggs should be eaten. Cod-liver oil by inunction or by mouth is an excellent remedy and may be advantageously combined with phosphorus or lime salts.

SCURVY is a nutritional disease characterized by hemorrhages of the periosteum, subcutaneous tissues, and gums. In children the disease is produced by feeding on sterilized milk or artificial foods.

The symptoms consist of weakness, irritability, bleed-

Child with marked rhachitis.

ing of the gums,—if the teeth have been cut; otherwise the gums will escape. There may be subperiosteal hemorrhage, especially of the femur and tibia, and subcutaneous extravasations at any point. The diagnosis of the disease may be easily made, as there is little else to confuse it with except purpura hæmorrhagica.

Treatment of the condition is usually very satisfactory. Sterilization of the milk should be abandoned and the mixture made higher in proteid percentage. Fresh orange juice, lime juice, or lemon juice should be given daily, and likewise gruel.

CRETINISM is a condition of idiocy and dwarfism associated with myxœdema and absence of the thyroid gland. The disease occurs either sporadically or exists endemically, and the causes are hard to explain. The disease is very rare in this country and therefore no further description seems necessary.

DISEASES OF THE NERVOUS SYSTEM

CEREBRAL PARALYSIS OF CHILDREN is the name given to a group of various paralyses occurring either at birth or very shortly after. The causes are traumatic,—injuries received by the head in labor, either from forceps or the natural course of events,—syphilis in the mother, hemorrhage, thrombosis, and infectious diseases.

The paralytic *symptoms* may be confined to one side or the other, or may involve all the extremities. If the paralysis occurs some time after birth, symptoms similar to those of an apoplexy are noted, such as convulsions and coma. The paralyzed part, at first flaccid, soon becomes rigid, usually not greatly emaciated, and eventually contractures form, rendering the limb almost unmanageable. Further development ceases and the limb often remains like that of an infant or young child. Sensation usually remains unaffected. The mind, how-

ever, is usually much impaired, as subsequent to the cerebral lesion that primarily causes the paralysis there is atrophy of the diseased side of the brain.

The prognosis depends on the extent of brain tissue involved, and the question of walking or using the arms or hands has the same relation. Recovery cannot take place.

Treatment.—During the convulsive stage chloral, bromides, hot baths, with ice to the head, should be relied on chiefly. Subsequently gymnastics, electricity, and Swedish movements may be tried, but will have small result. The child, if mentally feeble, should be placed in an institution.

Acute Anterior Poliomyelitis (spinal paralysis of children) is a disease occurring in young children, usually from one to four years of age. The cause is unknown, but is probably of infectious nature. The disease has its incidence almost entirely in the warm months and attacks a child while in perfect health without any previous warning. There are fever (104° to 105° F.), convulsions, stupor, and hebetude. The convulsive symptoms may last a short time, or even for a week, and then, perhaps for the first time, the presence of a paralysis is noted. On the other hand, the nervous symptoms may be absent, and after an elevation of temperature lasting for but a few hours the paralysis may develop. Either one or both extremities are involved, more frequently one leg, and at first the paralysis is more marked and more extensive than later on. After one or two weeks usually the paralysis, to a certain extent, improves, though always there remains a number of muscles that are permanently involved. The type of paralysis is flaccid and atrophy rapidly takes place. Later on, contractures may follow, due to the contraction of those opposed muscles which are not affected. Pathological changes are found in the cells of the anterior

horns of the spinal cord and secondary degeneration of the motor nerves and the muscles corresponding to the nutritive cells involved.

Treatment.—During the convulsion ice should be applied to the head, warm baths given, bromide and chloral internally. Subsequently, massage, electricity, and gymnastics may be indulged in with the hope of restoring to some extent the usefulness of the limb involved.

NIGHT-TERRORS.—A form of nightmare occurring in children, in which a child will cry out and exhibit signs of abject terror, sitting up in bed with eyes staring wide open, talking incoherently, oblivious to surroundings and unmindful of the faces about him. Only with difficulty and after some time has elapsed is it possible to arouse him, but when this is accomplished, as a rule, the attack is ended and the child, exhausted, falls asleep.

The causes are digestive and nervous. A child subject to such attacks should have but a light meal before retiring, the functions of the bowels should be carefully regulated, and alarming tales, or ghost stories, should be interdicted. Drugs are seldom necessary.

LARYNGISMUS STRIDULUS (spasm of the glottis) is a peculiar nervous condition in children, coming on without previous catching cold, sore throat, or, indeed, any warning whatever. It is characterized by the sudden stopping of breathing, in spite of efforts by the respiratory muscles, for a period of from half a minute to a minute, during which time the child is blue, the eyes prominent and anxious in expression, and the picture one provocative of great alarm. When the spasm relaxes there is a loud, crowing inspiration and the distress for the time being is relieved.

Treatment.—The object is, of course, to relax the spasm, and this may be accomplished by throwing cold water on the child's chest or slapping the chest with wet towels, by plunging the child into hot water, and, in

the event of failure of these means, intubation might be performed if a very skilful operator be available. Between attacks the general condition of the child should be most carefully looked after and sedative drugs, such as bromide or chloral, may be given occasionally if the child is restless and nervous at night.

CHOREA (St. Vitus's dance) is a disease of childhood, characterized by uncontrollable movements of the extremities, face, and trunk, accompanied also by mental change. The cause of the disease, which by many is believed to be of infective nature, is unknown. It is more common in spring than at any other season, occurs with great frequency in those of rheumatic diathesis, and gives rise to endocarditis. That it is cerebral in locality and embolic in nature is held by some, though hitherto autopsies have not substantiated this view. Girls are more commonly affected than boys. The disease first manifests itself by twitching of the arm, face, or trunk, varying in degree, coming on gradually, and increasing in the same way. At the same time there are mental changes evidenced in the disposition of the child, which may become tearful, irritable, and gloomy. These choreic movements may increase to such an extent that the patient is unable to stand up, feed himself, or save himself from injury. More commonly the symptoms are milder, and consist in twitching of the face, shrugging of the shoulders, and jerking of the hands and arms, with less involvement of the feet and legs. Sometimes choreic patients take long, sighing breaths which may be due to a participation of the diaphragm in the choreic spasm. Endocarditis develops in a large percentage of cases and renders this disease very much more serious.

Treatment.—The child should be at once removed from school and freed from all demands on its strength, either physical or mental. In the average case it is not necessary to keep the child in bed, though it is wise to do so

for the first few days while the symptoms are developing, and also at any time that cardiac complications appear. Of all drugs arsenic is the one most to be relied on, and should be pushed to the physiological limit. Bromides are useful and lukewarm or cool baths may be given daily.

Prognosis is good as far as recovery is concerned, but, if endocarditis develops, there will be a lasting lesion.

ENURESIS may be either nocturnal (more common) or diurnal. The causes are many, but not infrequently no cause whatever may be found. Seat-worms, cystitis, stone in the bladder, constipation, and adherent prepuce should all be looked for.

Treatment.—The amount of fluid taken by the child should be curtailed, particularly as night approaches; the bowels should be regulated and the child made to pass urine just prior to going to sleep. Of the drugs used there are none that are specific or so many would not be named in every text-book. The most effective are tincture of belladonna, bromides, and rhus aromatica in ascending doses.

No benefit ever arises from disciplining a child for this trouble, which he is unable to control, and which often is a source of deep shame to him.

DISEASES OF THE HEART

Diseases of the heart in children present the same picture as in adults, with the exception of congenital lesions. Congenital diseases may be due either to an endocarditis or to anomalies in the formation of the heart. These congenital lesions are nearly always on the right side of the heart.

Pulmonary stenosis and insufficiency, patulous foramen ovale, and incomplete closure of the interventricu-

lar septum are among the lesions. Victims of these conditions rarely live very long, and the subject is more of scientific than of humanitarian interest.

The most common lesion is that of PULMONARY STENOSIS, and the symptoms of this lesion alone will be described. The child is noticed either to be cyanosed or to become so on exertion or coughing; the right side of the heart is hypertrophied, and a systolic murmur is present at the pulmonic cartilage transmitted towards the left shoulder. Clubbing of the fingers is marked in those who live long enough for it to develop. Treatment, of course, is purely hygienic and of but little avail.

INTUSSUSCEPTION is an invagination or telescoping of one segment of the bowel into another and usually takes place at the ileocæcal valve. The causes are constipation, worms, unusual exercise, or strain, or, indeed, anything which might contribute to a spasm of the intestines.

The symptoms are vomiting, pain in the abdomen, appearance of a sausage-shaped tumor usually along the course of the colon, the passage of blood, and the subsequent collapse of the patient unless the intussusception be reduced.

Treatment is directed towards the reduction of the bowel, first by manipulation, and, that failing, either by introducing air or water under pressure into the rectum. Finally surgical interference should not be long delayed if other means are unsuccessful.

ICTERUS NEONATORUM is the term applied to jaundice, appearing at birth, or shortly after, and due either to the ordinary causes of obstructive jaundice or to some more serious cause, such as absence of the biliary duct, or syphilis of the liver. As a rule, the more simple form is met with and recovery takes place without treatment.

MELÆNA is a condition in young infants similar to the hemorrhagic diathesis in which dark, altered blood is

passed from the bowels. It is a serious symptom, but recovery often takes place.

PECULIARITIES OF PULSE AND RESPIRATION OF INFANTS; MOUTH-WASHES; SLEEPING POTIONS

In making the daily notes of a child's condition and in preparing the chart, it is necessary that the nurse should be acquainted with certain variations from adult conditions which exist normally in children. Thus, the pulse and respiratory rates are more rapid, and the temperature is higher in the very young.

Miller's table gives the following rates: at birth the pulse-rate ranges from 130 to 140; during the first year, from 115 to 130; in the second year, from 100 to 115; third year, 90 to 100; seventh year, 85 to 90; fourteenth year, 80 to 85.

At birth and until the twelfth month the respiration-rate is between 40 and 50. Until the second year the rate is about 35 per minute. After the second year the rate is practically the same as in adults.

Temperature in very young children is apt to be a little higher than in adults, and, as has already been stated, is subject to variations from slight causes. Any temperature over 100° F. in a baby, however, must be regarded as indicating the presence of fever.

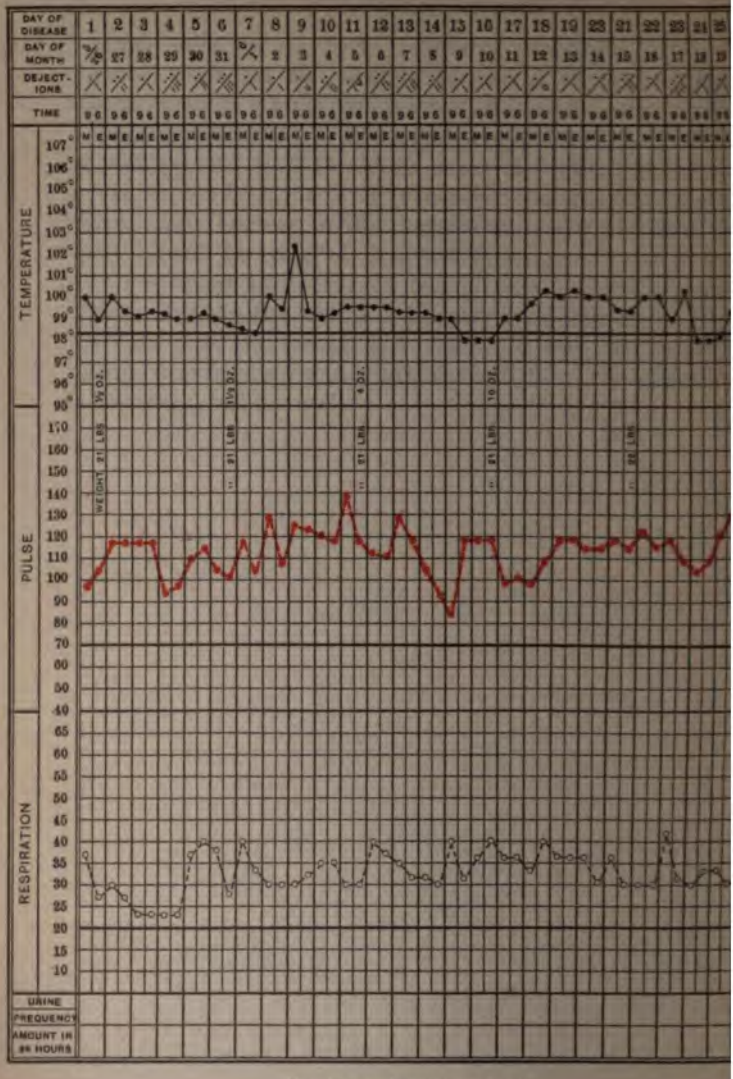
It is a fact often overlooked by nurses that difficulty in nursing or even absolute refusal of the child to take the nipple may be due to local causes, such as the existence of a sore mouth or stopped up nostrils. These conditions should always be looked for and treated.

Mouth-washes prescribed for children should always be non-poisonous in character, as very frequently a child will swallow some of the wash in spite of the most careful directions.

A nurse should always discourage the use of patented preparations to make children sleep, as nearly all of these

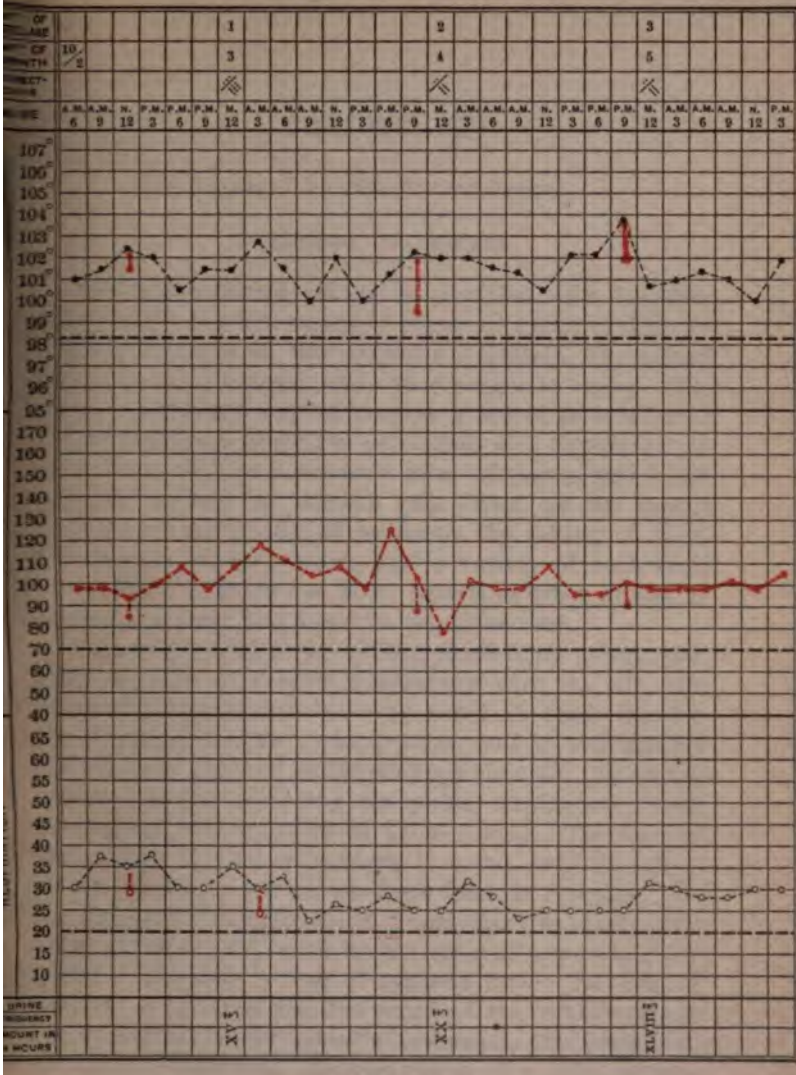
"short cuts to comfort" contain morphine, and on several occasions the author has seen serious chronic morphinism in young babies from the use of one or other of these preparations. Some mothers defend the practice on the ground that the child using it is healthy in appearance and seems well (usually the reverse is the case). The answer to this argument is simply that the baby is well in spite of, and not because of, the giving of such drugs to one of its tender age. Even in these apparently healthy children inquiry will generally elicit the fact that the bowels are costive or subject to alternating constipation and diarrhœa and that the digestion is anything but normal.

CHART IN USE AT THE



Morning and evening chart.

PHILADELPHIA HOSPITAL.



Third-hour chart.

CHAPTER XIV

The Keeping of Records—Diet and Recipes.

KEEPING OF RECORDS

THE nurse should always be provided with temperature charts and large pads of paper on which to note the various changes of the patient's condition, the taking of medicine, enemata, and other necessary notes. The most satisfactory way of keeping a record is to note on the temperature chart the prominent and important observations, and on a separate piece of paper, ruled into columns to suit the nurse's own views, let the record be kept of the giving of medicine, the taking of food, the amount of sleep taken, and a variety of such facts which serve to guide the nurse herself or other nurses, if there be several employed in the same case.

The author prefers the Wilson chart to all others, possibly because of greater familiarity with it. On this chart the temperature may be noted in black ink for the 8 A.M. and 8 P.M. temperature, and in red ink for the intervening third or fourth hour changes. There are spaces also for recording the pulse, respiration, bowel movements, and quantity of urine passed. The time of the giving of tubs or sponges is noted, and the effect shown one-half hour or one hour later as directed. At the Pennsylvania Hospital it is customary to make other notes on the chart, such as the date of appearance of spots, if the case be one of typhoid fever, the date of the taking of blood and the result of the Widal test, or the examination for malarial parasites, the giving of enemata or laxatives, the occurrence of a chill or convulsion, the institution of any change in the diet and

the giving of a bed rest. The color and consistency the stools is expressed by the initials of the words c sired—s. y., soft yellow; h. b., hard brownish. A thi sheet on which to note the treatment is necessary, a if the physician himself does not write the treatme the nurse should do so at the time the order is given a submit it to the physician for approval. In many stances, for one reason or another, it is impossible eith to give the medicine at the proper time or to give t whole amount. In such case it is of great importance note these facts in the report. A too cumbersome rep is always to be avoided, and only such facts as ha already been mentioned need be written down. Oth observations may be communicated verbally to t physician if asked for; or, if of importance, should given whether asked for or not.

DIET

In most conditions of sickness the stomach and dig tive organs in general are unable to take care of the us diet of the patient while in health, and, indeed, it wo be undesirable to continue this diet even if its digest were possible. We are therefore in the habit of limit the diet, particularly of febrile cases, in various w according to the degree and character of the sickness, duration of the disease, and the needs of the patient.

We are in the habit of giving patients who are v acutely ill with some febrile process a diet consist of milk only, given at intervals of every three or f hours, in such quantity as to make the total amo given to an adult equal two and one-half quarts twenty-four hours. Thus, six ounces every third h or eight ounces every fourth hour would fulfil the quirement. Children require much less, and the amo should be graded according to the age of the child.

ST. BARTHOLOME

Patient's Name, _____

MONTH															
DAY															
DAY OF DISEASE															
F°	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.7.11	3.
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95°															
PULSE M / E															
RESP. M / E															
B.O.															
AMT. OF URINE															
SP. GR.															
ALBUMEN															
SUGAR															

Temperature Chart in use at St. Bartholom

The next most rigid diet is the liquid diet, which consists of milk and broths—usually chicken-broth. One pint of the milk diet may be replaced by one pint of the chicken-broth or may be given in conjunction with the full milk diet. When the milk is not all being digested curds appear in the stools and are evidences that too much milk is being given, or if the quantity of milk be already small it is a sign of great weakness of the digestive juices. Under such conditions the milk may be diluted with lime-water or soda-water, or be peptonized. As the fever abates and the general condition improves the appetite returns, and the patient may be gradually led back to the normal diet. At first soft, easily digested articles of food should be given, such as milk-toast, cereals of various kinds, soft-boiled eggs, gelatin, custard, junket, and a change of fluid begun, tea, lemonade, or wine being substituted for the milk. It is well, also, to add some fruit to this diet in order to prevent constipation, which is apt to occur when the diet is limited and of a kind which leaves but small residue; oranges, stewed peaches, pears, or prunes are useful for this reason.

The next step in the increase of diet is the addition of meat and vegetables. Such easily digested lighter meat, as sweet-breads, squab, chicken, or oysters, may be first prescribed, to be followed by beef-steak or a lamb chop. Boiled rice or a baked potato and dry toast may be added, and the dessert may consist of junket, custard or ice-cream, or a baked apple.

During convalescence from a disease which has caused great emaciation, it is especially desirable that the patient should take as much food as possible, yet at the same time the organs of digestion must not be overtaxed. A milk-punch, cup of bouillon, or chocolate may be given between the meals.

It seems almost unnecessary to speak of the importance of properly serving the food of an invalid, and yet in

some respects this is quite as delicate a question as the kind of food itself.

Neatness and cleanliness of the dishes, cups, and trays should be insisted upon, and every care taken to bring the food to the bedside in the most attractive way possible. The hours of the meals should be regular and the time originally selected with due regard to the other necessities of the invalid. The broths, meats, vegetables, tea, or coffee should be hot and on hot plates and should be brought to the patient directly from the stove. The hands and clothing of the nurse at this time should be scrupulously clean.

There are certain principles of cooking which a nurse should understand in theory and practice and certain articles of sick-diet that she should be able to prepare. In regard to the theory of cooking and the preparation and use of a certain few liquid foods I can do no better than quote from a lecture to nurses delivered by Dr. F. P. Henry to the nurses of the Philadelphia Hospital:

"The beneficial effect of cooking is most marked upon starchy substances, which make up at least two-thirds of the food we eat. But for the art of cooking, the immense supplies of cereal food would be unavailable. Starch, whether it exists in tubers or grains, has the same composition. It is contained in minute granules or cells, of which the wall is formed by a substance called cellulose. By boiling starch, its component granules swell up enormously, owing to absorption of water, burst their investing layer of cellulose and fuse into a mucilaginous mass which is digested with great readiness. The layer of cellulose which surrounds each starch granule is quite indigestible, so that, as I have said, but for the art of cooking, starchy food would be of little use to us. The effect of cooking albuminous or proteid substances is to render them much more digestible, although we are ignorant of the precise nature of the changes they undergo

during the process. For example, if a mixture be made of one part of white of egg to nine of water, it will be found to be very slowly acted on by pepsin and hydrochloric acid; but after being boiled it is very rapidly digested, although not sensibly differing from its uncooked state. The same is true of the gluten of wheat. The effect of cooking, therefore, upon the greater number of our food substances is to lessen the work of our digestive organs. It may be, in fact, regarded as the first, and by no means the least important, stage of the digestive process. The necessity to healthy people of cooking—*i.e.*, partially digesting their food—has long been admitted by everyone, but very recent is the suggestion that this process should be carried much further for the sick. The marked conditions common to the greatest number of diseases are fever and anæmia; in fact, one or other, or both, are almost invariably present. Since the observations of Beaumont in the celebrated case of St. Martin, it has been known that during fever the gastric mucous membrane is dry, red, and irritable, and secretes very little gastric juice. The gastric juice is wanting in acidity, also, in catarrh of the stomach and in cancer, while experiments on animals show that in the anæmia produced by great loss of blood the gastric juice has very feeble digestive power. In such conditions, therefore, and they are very common, the work which, in health, is relegated to the stomach, should be done outside of the body. That is to say, the food, in addition to being cooked, should be peptonized.

"Milk, which is the typical food, is also the one that is most readily peptonized. Of the three organic ingredients which it contains,—viz., sugar, fat, and casein,—the two first require little or no change to render them capable of absorption into the system, so that the action of the peptonizing process is expended in converting casein into peptone. For this purpose either fluid or

solid extracts of the pancreas are employed. There is a preparation known as liquid pancreatin, which is simply a dilute alcoholic extract of the pancreas. It was discovered years ago by Eberle that a watery infusion of the stomach or pancreas possesses the same digestive powers, although in a lesser degree, as the natural secretions of these glands. A watery solution of organic matter will, however, soon undergo decomposition, and for this reason various substances were added as preservatives. The best of these are boracic acid, chloroform, and dilute spirit, and of the three the last is decidedly the best. The strength of the liquid should be in the proportion of 20 to 25 per cent. of rectified spirit. This amount does not interfere with its digestive powers and enables it to be kept indefinitely. There is a dry extract of pancreas that is more used than any other preparation. The bottle containing the extract also contains a small measure which holds five grains and another measuring fifteen grains. The following is the method of using the dry extract in peptonizing milk: Five grains of pancreatic extract and fifteen of bicarbonate of soda are dissolved in a gill (four ounces) of cold water and then added to a pint of fresh, cool milk. This milk is then poured into a bottle and placed in water as hot as can be borne by the hand, where it is left for twenty minutes. By that time it will have acquired a slightly bitter taste. Now, it is important not to let the process go too far, because in that case the taste of the milk will be so disagreeable that the patient cannot be induced to take it. You must remember that the digestion begun in this manner will be continued in the stomach without throwing any work on that organ. In other words, the pancreatic extract which you have added to the milk will continue to act after the milk has been swallowed, or outside of the body if kept in a warm place. Now, suppose the patient is not ready to

take the milk after you have partially digested it in the manner described. How are you to stop the action of the pancreatic extract before it has gone so far as to render the milk nauseous to the strongest stomach? There are two ways of doing this. All ferments are destroyed by a heat of 212° F., and, therefore, if you boil the peptonizing milk you will at once put an end to all further digestive action. This, however, is not desirable, for you want the digestive action to continue in the stomach without any aid from that organ. Instead, therefore, of boiling the peptonizing mixture, you will place it on ice, for it has been found that a low temperature suspends the peptonizing process without destroying it. The most convenient mode of peptonizing milk is with the aid of the peptonizing tubes, each one of which contains the materials (five grains pancreatic extract and fifteen grains bicarbonate of soda) for peptonizing one pint of milk. In using the liquid preparation the same process exactly is employed.

"The peptonized milk may be given to the patient alone or in various combinations. It is an excellent vehicle for stimulants. Many people who are unable to take milk-punch as ordinarily made will find a peptonized milk-punch easily digestible. It will readily occur to you that numerous articles of food having peptonized milk for their bases may be prepared for the sick. Among them are peptonized milk gruel, peptonized porridge and milk, and peptonized milk jelly. The last-named is very palatable, and is composed of peptonized milk, to which, while hot, a certain amount of gelatin is added. It is sweetened, flavored with orange or lemon, wine, brandy, or rum, and eaten cold. It is by no means necessary to peptonize milk in all cases in which that substance is administered, but merely in those in which digestion is impaired. The most striking indication of this condition is a dry mouth. It may be set down as a

rule that whenever the mouth is dry the food should be peptonized.

"Beef tea and other animal broths are useful adjuncts to milk, but are far inferior in nutritive value. They are, in reality, little more than peptogens,—*i.e.*, stimulants to the gastric secretion. This office of beef tea is, however, by no means unimportant, and when well borne it should be given daily in moderate amounts. When given to the extent of two pints or more a day, it is almost certain to excite diarrhœa on account of the large proportion of potassium and other salts which it contains. When a meat preparation is given with the object of supplying albuminous waste, an object which ought to be borne in mind in every case of acute fever, it should be given in a partially digested form, as in the well-known preparation of beef peptonoids.

"*Koumiss.*—This preparation of milk, which has been used for centuries in Tartary, is one of the most valuable in the sick-diet list. In Tartary and Asiatic Russia it is made from mare's milk, which differs from that of the cow in that it contains a smaller amount of casein and fat and a decidedly larger amount of sugar. When sugar is added to cow's milk the koumiss thence obtained is, consequently, much more nutritious than that prepared from mare's milk. Koumiss is fermented milk, and therefore contains alcohol, but in the smaller quantity of from two to three per cent. Its frequent tolerance by a stomach which rejects all other kinds of food is due to several important factors. In the first place, it is taken cold; in the next, it contains a large quantity of carbonic acid gas, which exerts a sedative action on the nerves of the stomach; thirdly, it contains, as already stated, a small percentage of alcohol, and, finally, the casein is changed into acid albumen and peptone,—in other words, partially digested. With a little attention to some important details, koumiss may be readily made by

anyone, the sole ingredients requisite being milk, sugar, and yeast."

RECIPES

Koumiss.—Take 2 quarts of milk; 2 tablespoonfuls of sugar; 2 tablespoonfuls of boiling water; ⅓ of a Fleishmann's yeast-cake. Heat the milk to 98° F. in a double boiler. Boil the water and sugar together for a moment. Dissolve the yeast in a little of the warm milk and add it and the syrup to the milk, stirring carefully until thoroughly mixed. Bottle in beer-bottles, cork, and stand in a warm room (72° F.) for twelve hours. Then place the bottles on their sides in a refrigerator. Koumiss should be at least thirty-six hours old before it is used.

Bethlehem Oatmeal Gruel.—Take 2 slightly rounding tablespoonfuls of Bethlehem oatmeal; 1 pint of boiling water; ¼ teaspoonful of salt. Moisten the oatmeal with a little cold water; pour over it the boiling water, stirring carefully; add the salt. Stir over the fire until it boils. Cover and let it boil slowly for twenty minutes. Serve with sugar and cream. A teaspoonful of sherry may be added.

Corn Meal Gruel.—Take 2 level tablespoonfuls of granulated corn meal; 1 pint of boiling water; ¼ teaspoonful of salt. Moisten the corn meal with a little cold water. Add the boiling water, stirring carefully, and the salt. Pour into a saucepan and stir over the fire until it boils. Cover and let it boil very slowly for a half-hour. Serve with sugar and cream.

Flour Gruel or Pap.—Take 2 level tablespoonfuls of flour; 1 cup of boiling water; 1 cup of milk; ¼ teaspoonful of salt. Moisten the flour with a little cold water; add the boiling water, stirring carefully, and the salt. Stir over the fire until it boils and let it boil slowly for five minutes. Then add the milk and stir until the

gruel comes to boiling point. It may be sweetened slightly and flavored with nutmeg or grated lemon-peel.

Flour Ball and German Gruel.—Put 1 pint of flour into a strong bag, tie lightly with twine, throw into a kettle of boiling water, and boil constantly for five hours, filling up the kettle from time to time. When done, take off the cloth and peel off the outside moist portion. Grate the ball, put it into a baking-pan, and dry in a moderate oven for two hours, being careful not to brown. Moisten 2 rounding tablespoonfuls of this flour with a little cold water, pour over it ½ pint of boiling water, stirring carefully, and boil slowly for three minutes. Add ½ saltspoonful of salt, a teaspoonful of sugar, and a gill of hot milk. Excellent in cases of diarrhœa, especially with children.

Arrowroot Gruel.—Take 2 scant tablespoonfuls of arrowroot, 1 pint of milk, ¼ teaspoonful of salt. Heat the milk in a double boiler. Moisten the arrowroot with a little cold water and pour it into the hot milk, stirring carefully until it thickens. Add the salt, and let it cool for five minutes. May be sweetened and flavored with 1 or 2 tablespoonfuls of sherry.

Arrowroot with Egg.—Separate one egg; beat white and yolk separately until very light, and then combine these. Add slowly 1 pint of arrowroot gruel. Serve with toasted crackers.

Plum Porridge.—Take 12 raisins, 1 pint of milk, 1 slightly rounding tablespoonful of corn-starch, ¼ teaspoonful of salt. Chop the raisins, add them to the milk, and heat in a double boiler. Cook for half an hour and strain. Moisten the corn-starch with a little cold milk, add it to the hot milk, stirring carefully, and cook for fifteen minutes. Add the salt, sweeten, and serve.

Farina Mush.—Take 1 quart of milk; ½ cup of Hecker's farina; 1 level teaspoonful of salt. Heat the milk in a double boiler. Mix the farina with a little

cold water, and pour over it the hot milk. Add the salt, return to the boiler, and stir until it begins to thicken and let it cool for half an hour. Water may be used instead of milk.

Cornmeal mush may be made in the same way, using water.

Oatmeal Mush.—Take 1 quart of boiling water; 1½ cups of avena; 1 teaspoonful of salt. Use a double boiler; add the oatmeal slowly to the salted water. Stir; let it cook for five minutes, then stir again. Then allow it to cool for one hour without stirring.

Boiled Rice.—Take 3 quarts of boiling water; 1 cup of rice; 1 teaspoonful of salt. Add the salt to the water, and when it is boiling rapidly pour the rice in slowly, so as not to stop the boiling. Stir the rice from the bottom of the boiler, and continue the rapid boiling for one-half hour. Drain off the water, and stand the rice in the oven for five minutes with the door open, to dry out.

Albumen and Milk.—Take the white of 1 egg; ½ pint of milk. Place in a Mason jar, and shake well for a half minute. Albumen water may be made in the same way, using water instead of milk and flavoring with a little lemon juice if allowed.

Egg-Nog.—Take 1 egg; 1 teaspoonful of sugar; 1 tablespoonful of brandy; 1 cup of milk. Beat the yolk of the egg with the sugar in a glass, add the brandy carefully so as not to curdle the egg, then stir in the white, beaten stiff but not dry. Finally add the milk, and stir until thoroughly combined.

Milk Punch.—Take 1 tablespoonful of brandy; 1 teaspoonful of granulated sugar; ½ pint of warm milk. Put the brandy and sugar into a glass and add the milk, poured in from a height. It improves the milk punch to pour it from one glass to another two or three times.

Cinnamon Tea.—Take ½ ounce of stick cinnamon; 1 pint of boiling water. Break the cinnamon into small

pieces and put them into an agate saucepan; add the water, cover, and stand on the back of the stove for ten minutes.

Mulled Wine.—Take ½ pint of boiling water; 1 tablespoonful of finely broken stick cinnamon; 10 whole cloves; 2 tablespoonfuls of sugar, and 1 gill of hot sweet wine. Put the water, cinnamon, and cloves into a saucepan, cover, and steep for ten minutes. Strain. Add the wine and sugar, and boil up once. Good diuretic and diaphoretic.

Wine Whey.—Take ½ pint of milk; ¼ cup of sherry. Heat the milk in a double boiler. Add the sherry quickly, giving one stir. Let it stand for five minutes over the fire, then strain through a damp flannel cloth. Or, if wine be not used, a teaspoonful of lemon juice may be added to the hot milk or the milk may be heated to 150° F. and 1½ teaspoonfuls of wine of pepsin or 1 teaspoonful of Fairchild's essence of pepsin may be stirred in. Let the mixture stand until firmly coagulated, then beat up the curd until finely divided, and strain.

Toast Water.—Cut a slice about half an inch thick from a baker's loaf, and toast over a slow fire until thoroughly dry and a dark brown. Put the toast into a bottle and cover with 1 pint of boiling water. Stand aside until thoroughly cold, then strain, and it is ready for use. This will quench thirst more quickly than cold water and is slightly nutritious.

Flaxseed Tea.—Take 2 tablespoonfuls of whole flaxseed; 1 pint of boiling water. Let simmer for one hour; strain; add the juice of a lemon and 1 tablespoonful of sugar.

Tea.—First scald the pot. Put in a teaspoonful of tea for each person, and pour over it the required amount of boiling water. Let it stand for from three to five minutes and serve. Water for tea and coffee should be freshly boiled.

Boiled Coffee.—Take 2 tablespoonfuls of finely ground coffee. Mix ½ a crushed egg-shell or a teaspoonful of the white of egg with a little cold water and add to the coffee, with enough more cold water to moisten. Add ½ cup of freshly boiled water, and stand over the fire until it boils up once. Stir down, pour in ¼ cup of cold water, stand back for five minutes, and serve.

Percolated Coffee.—Put 2 rounding tablespoonfuls of coffee into a percolator; pour over it 1 pint of boiling water. Let it slowly strain through. Stand on the back of the range for five minutes, when it is ready to serve.

Cocoa.—Take 1 quart of milk; 2 tablespoonfuls of cocoa. Heat the milk in a double boiler. Moisten the cocoa with a little cold milk or water, and pour it into the hot milk, stirring carefully. Beat for a moment with an egg-beater or a chocolate-beater; let cook for five minutes, and it is ready to serve. Broma Alkathrepta and Racahout are made in the same way.

Lime-Water.—Place a small lump of lime in 1 quart of water. Shake for five minutes, and then let it stand for several hours. Remove scum from surface and decant. It is of fixed strength.

Barley-Water.—Take 2 tablespoonfuls of pearl barley; 2 quarts of boiling water. Boil slowly until it is reduced to 1 quart. Strain.

Beef Tea.—Take 1 pound of beef from the sticking piece; 1 pint of cold water. Free the beef from fat, cut or chop it very fine, put it into an agate saucepan, add the water, ¼ teaspoonful of salt, and a stalk of celery or a sprig of parsley, or both. Stir with a wooden spoon and stand it over the fire and heat it slowly to 155° F. Strain through a colander and put at once in a cold place. When it is cold skim off the fat and warm as it is needed; season with salt to taste. (Never heat beyond 160° F.)

Beef-Juice.—Broil a thick slice from the round on both

sides until slightly heated through. Cut it into pieces about two inches square, and squeeze the juice out with an old-fashioned lemon-squeezer or with a meat-press. Serve cold with a little salt.

Mutton-Broth.—Take 1 pound of the neck of mutton; 1 quart of cold water. Wipe the meat with a damp towel. Place in a saucepan with the water and bring slowly to a boil. Skim carefully and let it simmer slowly for two hours. Strain, stand away to cool, and when cool remove the fat. Add a tablespoonful of rice and a bay-leaf, a sprig of parsley, or a stalk of celery, and simmer for half an hour. Strain again. Season and serve.

Chicken-Broth.—Take ½ of a 4-pound chicken; 2 quarts of cold water. Cut up the chicken and crack the bones, add the water, and bring slowly to boiling point. Skim and simmer slowly for about three hours. Strain and stand away to cool. Skim off the fat, add a tablespoonful of rice, a sprig of parsley, or a bay-leaf, and simmer until the rice is done. Season to taste, strain, and serve, or, if allowed, the rice may be left in.

Bouillon.—Take 2 pounds of lean beef; 1 quart of cold water; piece of onion size of a quarter; 1 bay-leaf; 1 sprig of parsley, 1 stalk of celery. Free the meat from all fat and gristle and chop fine. Put it into a kettle with the water and flavorings and let it soak an hour, stirring occasionally. Then bring it slowly to a boil, skim, strain, season, and clarify. To clarify, let the bouillon come to a boil. Beat the white of an egg and the crushed shell with a half cup of cold water. When bouillon is boiling rapidly add the egg, give one quick stir, and allow it to boil up again. Throw in ½ cup of cold water, and stand back to settle. Strain through two thicknesses of cheese-cloth.

Cream of Potato Soup.—Take 2 good-sized potatoes; 1 pint of milk; 1 slice of onion; 1 sprig of parsley; 1 stalk of celery; 1 bay-leaf; 1 even tablespoonful of

flour; 1 tablespoonful or 1 ounce of butter; salt and pepper. Put the potatoes to boil in 1 pint of boiling water. Add the flavoring and simmer until the potatoes are tender. Heat the milk in a double boiler. Mix the butter and flour together, and beat into the hot milk with an egg-beater. Press the potatoes through a sieve, add ½ pint of the water in which they were boiled. When smooth add the thickened milk and seasoning and serve at once.

Cream of Tomato Soup.—Take 1 quart of milk; 1 pint of tomatoes; 1 bay-leaf; 1 sprig of parsley; ¼ teaspoonful of bicarbonate of soda; 1 tablespoonful of sugar; 1 blade of mace; 1 stalk of celery; 1 slice of onion; 3 even tablespoonfuls of flour; 1½ tablespoonfuls of butter; salt and pepper. Put the tomatoes on to heat with the flavoring. When they have begun to boil strain through a sieve and return to the fire. Heat the milk in a double boiler. Mix the butter and flour together and beat into the hot milk. Pour the tomatoes into a bowl, add the sugar and soda, and when effervescence begins stir the hot milk in carefully. Season and serve at once.

Cream of Celery Soup.—Take 3 stalks of celery; 1 quart of milk; 1½ tablespoonfuls of butter; 3 even tablespoonfuls of flour; 1 pint of boiling water; 1 slice of onion; salt and pepper. Wash the celery and cut it into small pieces. Cover it with the water; add the onion, and boil slowly for one hour. Press the celery through a sieve; add the water in which it has been boiled and enough more to make a pint. Heat the milk in a double boiler; add to it the celery and water. Rub the butter and flour together and beat into it. Season and serve.

Oyster Broth.—Take 12 oysters; 1 cup of milk; 1 cup of water; 1 even tablespoonful of flour; 1 ounce of butter; salt and pepper. Drain off the liquor and

put it into a saucepan over the fire. When it boils up skim and add water and oysters. Heat the milk in a double boiler. Rub butter and flour together and beat into hot milk. Pour oysters and liquor into a bowl and stir the thickened milk in carefully. Season and serve.

Clam broth may be made in the same way, first chopping the clams.

Clam Tea.—Drain the liquor from three clams and put over the fire in a saucepan. When scum rises skim, add cup of boiling water and clams chopped. Simmer for five minutes. Put tiny piece of butter in bouillon-cup, and strain over it the clam tea. Season with tiny bit of pepper and salt.

Croutons.—Cut stale bread into slices about one-third of an inch thick. Spread them lightly with butter, rubbing it in thoroughly. Cut off crust and cut slices into dice; place these in a pan in a moderate oven until they are a golden brown.

Gluten Bread.—Take ½ pint of milk; ½ pint of boiling water; ½ yeast-cake; 1 egg; 1 teaspoonful of salt; 1 teaspoonful of butter. Pour water over the butter, add the salt, milk, and the egg beaten light without separating. Dissolve the yeast in a little lukewarm water and strain it into the other ingredients. Add sufficient gluten flour to make a soft dough; knead thoroughly, mould into loaves, place them in greased pans, and, when very light, bake in a hot oven for three-quarters of an hour.

Gluten Gems.—Take 1 egg; ½ teaspoonful of salt; ½ pint of cold water; ½ pint gluten flour. Beat the egg without separating, add the water, flour, and salt. Beat thoroughly, pour into greased gem-pans that have been previously heated, and bake in quick oven for twenty-five or thirty minutes.

Milk Toast.—Take 1 cup of milk; 1 level teaspoonful of flour; 1 teaspoonful of butter; ¼ teaspoonful of salt. Heat milk in a double boiler and mix the butter and

flour and beat into it; add the salt. Toast two slices of bread a golden brown, put them in a hot dish and pour the milk over them.

Cream toast is made in the same way, omitting the thickening, and with half the quantity of salt.

Panada.—Take 6 stale rusks; 1 pint of boiling water; 2 teaspoonfuls of sherry. Cut the rusks into halves, put into oven until they are thoroughly dry and a golden brown. When cool put two pieces into a bowl, pour over them the boiling water and the sherry. Sweeten to taste. Serve hot.

Toasted Crackers.—Cut thick water crackers into halves, place them on the toaster and brown slightly on both sides. Butter them and serve on hot plate.

Raw Beef Sandwiches.—Scrape very fine two or three tablespoonfuls of fresh beef, season with a little salt, spread it between two thin slices of bread and butter. Cut into fancy shapes and serve.

Boiled Eggs.—Have eggs standing in the room some time before boiling. Put two into a small saucepan of boiling water. Cover and stand on the back part of the range for five minutes.

Poached Eggs.—Put some boiling water into a saucepan; add ½ teaspoonful of salt. Break the egg into a saucer, and, when the water boils, gently slide it in. Draw the saucepan to one side and baste the egg until it is done. Lift it carefully with a skimmer and put it on a piece of toast; season with salt and pepper and a tiny bit of butter.

Frothed Egg.—Separate an egg, being careful not to break the yolk; add a few grains of salt to the white and beat stiff. Put it into a small dish, making a nest in the centre for the yolk. Drop in the yolk gently, stand the dish in a pan of hot water and put in the oven for two minutes; put a little salt and pepper and a tiny bit of butter on the yolk and serve.

Shirred Egg.—Break an egg into a small baking dish and stand the dish in a pan of boiling water, and put in the oven until the white is set. Season with salt, pepper, and butter, and serve in the dish.

Scrambled Eggs.—Break two eggs into a bowl, beat them with a fork until thoroughly mixed, then add two tablespoonfuls of boiling water, beating all the while. Season with a saltspoonful of salt and one dash of pepper.

Chicken Jelly.—Take 1 pound of chicken; 1 pint of cold water. Crack the bones; add the water and bay-leaf or clove or stalk of celery, or all, and simmer slowly (about three hours) until reduced to half a pint. Strain, clarify (see recipe for bouillon), season with salt and pepper, and stand away to get cold.

Chicken jelly may also be made from the carcass alone, if the bones are carefully cracked.

Wine Jelly.—Take ½ box of gelatin (Knox); ½ pint of sherry or port; ½ pint of cold water; ½ pint of boiling water; scant ½ cup of sugar. Cover the gelatin with cold water and let it soak for half an hour. Stand it over a saucepan of boiling water until dissolved. Add the sugar, boiling water, and wine. Strain into moulds and put into refrigerator. Orange jelly may be made in the same way, though it may require a little more sugar.

Lemon Jelly.—Take ½ box of gelatin; ¾ cup of sugar; 1½ large lemons or 2 small ones; 1 pint of boiling water; ½ pint of cold water. Cover the gelatin with the cold water and let it soak for one-quarter hour. Stand it over boiling water to dissolve. Add sugar, boiling water, and lemon juice and strain into a mould. Stand in refrigerator.

Diabetic Lemon Jelly.—Take ½ box of gelatin; juice of 2 lemons; 3 grains of saccharin dissolved in a tablespoonful of hot water; ½ pint of cold water; 1 pint of boiling water. Cover gelatin with cold water and let it

soak for fifteen minutes. Stand it over boiling water to dissolve. Add the saccharin, boiling water, and lemon juice and strain into a mould.

Blanc-Mange or Milk Jelly.—Take ¼ box of gelatin; ¼ cup of cold water; 1¾ cups of milk; ½ teaspoonful of vanilla; 1½ tablespoonfuls of sugar. Soak the gelatin in cold water for fifteen minutes and dissolve over hot water; scald milk; pour it over the gelatin; add sugar and vanilla; strain into a mould; stand on ice.

Carrageen or Irish Moss.—Wash thoroughly ½ ounce of carrageenia; soak for one-half hour in 1 pint of milk. Put in a double boiler and let come to boiling point, strain, and add 1 pound of sugar. Put in a mould and let stiffen. Any of the jellies are particularly nice when served with whipped cream.

Bread Jelly.—Cut the crusts from 5 slices of stale bread. Toast them a light brown. Put them in 2 quarts of boiling water and let them boil to a jelly. Strain, sweeten to taste, and add the juice and grated rind of ½ a lemon. Stand in a mould on ice. It may be flavored with wine.

Tapioca Jelly.—Cover 1 cup of granulated tapioca with a pint of cold water and put to soak over night. In the morning put it into a saucepan with 1 cup of sugar, the rind and juice of 1 lemon, ½ teaspoonful of salt, and 1 pint of boiling water. Stir until it boils and is smooth. Turn into a mould and set to cool. Add a glass of wine if desired.

Barley Jelly for Infants' Food.—Put 2 tablespoonfuls of washed pearl barley into 1½ pints of water and slowly boil down to a pint. Strain and let the liquid settle into a jelly.

Fricasseed Chicken.—Cut up ½ a chicken and put into a saucepan. Nearly cover with boiling water. Set it over a moderate fire and let it simmer till tender. Put a tablespoonful of flour and a tablespoonful of butter

into a saucepan and stir over the fire until thoroughly mixed. Add carefully ¾ of a cup of the liquor in which the chicken was cooked and ¼ cup of milk or cream. Stir the sauce until it boils. Season with ½ teaspoonful of salt and a dash of pepper. Dish the chicken, pour sauce over it, and serve. The yolk of an egg may be added to the sauce when it is taken from the fire.

Broiled Steak.—Trim the steak free from all fat. Put the meat plate to warm. Place the steak in a broiler and put it over a hot fire; turn constantly. When done (in about five minutes), place it on a hot plate, sprinkle with salt and pepper, and spread with a piece of butter on top sides. Serve very hot. Chops are broiled in the same way.

Broiled Chicken.—Dust the chicken on the inside with salt and pepper. Place it on the broiler with the inside downwards. Broil over a slow fire for about three-quarters of an hour, turning from time to time to prevent scorching. When done, place on a heated plate, season with salt and pepper, and spread with butter. Squab may be broiled in the same way.

Roast Quail or Pigeon.—Pick and draw the bird. Wipe carefully inside and out with a wet towel, then dry it. Tuck the wings back and fasten the legs up to the side of the body with a small skewer so that when the bird is on its back the legs stand up. Spread the breast with butter and sprinkle with salt and pepper. Cover the bottom of the pan with boiling water, and roast in a quick oven, basting frequently. Serve on toast with the gravy poured around.

Creamed Sweeet-Breads.—Throw the sweet-breads into cold water, first washing thoroughly, and soak one hour. Then cover with boiling water; add a teaspoonful of salt and simmer twenty minutes. Throw them into cold water for five minutes, then pick them to pieces, rejecting

all the membrane; put a tablespoonful of butter and a tablespoonful of flour into a saucepan and stir them over the fire until thoroughly mixed; add 1 cup of milk, and stir till it boils; add ½ teaspoonful of salt and a dash of pepper and the sweet-breads, and stir until all is thoroughly hot. Before serving a tablespoonful of sherry may be added.

Broiled Sweet-Breads.—Wash and parboil the sweet-breads as directed in the recipe for creamed sweet-breads. Cut them in half lengthwise, just removing the outside membrane, and stand away to cool. When ready to broil season with salt and pepper and baste with melted butter. Broil over a clear fire for five minutes. Serve very hot with a little melted butter poured over them. They may be garnished with French peas.

Chopped Beefsteak.—Scrape the meat from a small piece of the round. Press the pulp into a round, flat cake, and broil over a very hot fire for about five minutes. Season slightly with salt and pepper and a little butter.

Farina Jelly.—Take ¼ box of gelatin; ¼ cup of cold water; 1 cup of milk; 2 level tablespoonfuls of Hecker's farina; 1 pint of cream (whipped); 1 teaspoonful of vanilla; 1 tablespoonful of sherry. Heat the milk in a double boiler, mix the farina with a little cold water, and pour the hot milk over it. Return to the fire and stir until it thickens. Let it cook for fifteen minutes. Soak the gelatin in the water for fifteen minutes and dissolve it over hot water; strain it into the farina; add the vanilla and sherry and pour into a basin which is standing in a bowl of cracked ice. When cold fold in the whipped cream carefully and stir until it gets smooth and velvety. Pour into a mould and stand in the refrigerator.

Cream Jelly.—Take 2 level teaspoonfuls of gelatin; ¼ cup of cold water; 1 cup of cream; 2 tablespoonfuls of sugar; 2 tablespoonfuls of wine; ½ teaspoonful of

vanilla. Soak gelatin in cold water for two minutes. Let dissolve in saucepan of boiling water. Add wine, sugar, and vanilla. Stir in the cream carefully; strain; pour into a mould, and stand on ice.

Rice Pudding.—Take 1 quart of milk; 2 tablespoonfuls of sugar; 2 tablespoonfuls of rice. Put into a baking-dish, and bake in a very moderate oven for two hours, stirring it every fifteen minutes.

Baked Custard.—Take 4 eggs; 3 tablespoonfuls of sugar; 1 quart of milk. Beat the eggs until thoroughly mixed; add sugar and milk and stir for a moment. Put into custard-cups; add a grating of nutmeg; stand in a pan of hot water and bake until thoroughly set (about forty minutes).

Boiled Custards.—Take 1 quart of milk; 4 eggs; 3 tablespoonfuls of sugar. Put the milk in a double boiler. Separate the eggs; add the sugar to the yolks and beat thoroughly. Pour the hot milk over the yolks and sugar, return to the fire, being sure that the water does not boil in the double boiler. Stir until the custard is like cream. Pour into a baking-dish and add a teaspoonful of vanilla. Beat the whites stiff and dry, sift over them 2 tablespoonfuls of granulated sugar and ½ teaspoonful of vanilla, and beat again. Place in teaspoonfuls over the custard and brown slightly in a hot oven.

Junket.—Take 1 quart of milk; 2 tablespoonfuls of sugar; 1 teaspoonful of vanilla; 2 teaspoonfuls of rennet. Heat the milk to 98° F. (lukewarm); add the sugar, vanilla, and rennet. Pour into custard-cups; add a grating of nutmeg, and stand on the table until they have stiffened. Then place in refrigerator.

Egg Junket.—Take 1 quart of milk; 2 eggs; 3 tablespoonfuls of sugar; 3 teaspoonfuls of rennet; 1 teaspoonful of vanilla. Heat the milk to 110° F. Separate the eggs, beat yolks and sugar together, and add the milk. Beat the whites light, but not dry, and fold into the

milk. Add the vanilla and rennet. Pour into egg-glasses. Add a grating of nutmeg, and stand by the stove until stiffened, then put in the refrigerator.

Velvet Cream.—Take ¼ of a box of gelatin; ¼ cup of cold water; 1 pint of cream; ⅜ of a cup of powdered sugar; 1 teaspoonful of vanilla; 1 tablespoonful of sherry.

Soak the gelatin in cold water for fifteen minutes and dissolve over hot water. Add the sugar and flavoring, strain into the whipped cream, and stir in a basin over cracked ice until smooth and velvety. Pour into a mould, then put in a refrigerator.

Plain Omelet.—Separate 2 eggs, beat yolks with 2 tablespoonfuls of boiling water. Beat whites until stiff, but not dry. Combine carefully with yolk. Put ¼ teaspoonful of butter in an omelet-pan, melt, pour in egg, and let it cook slowly until thoroughly set. Take pan to table, season with salt and pepper, fold over, and turn into a hot dish.

French Omelet.—Beat 2 eggs with 2 tablespoonfuls of boiling water until thoroughly mixed. Put ⅛ teaspoonful of butter in an omelet-pan, allow it to melt, pour in egg, and allow it to cook until done. Season with salt and pepper and take to table. Fold over and serve in a hot dish.

Panned Oysters.—Strip 8 oysters and remove the eyes. Put in a saucepan with ¾ of a teaspoonful of butter, a little salt, and a little pepper (red). Stir constantly until their beards curl. Serve on hot buttered toast.

Scalloped Oysters.—Strip oysters. Put one layer in a baking-dish. Sprinkle with a thin layer of bread crumbs, season with salt and pepper and a few dots of butter. Repeat this until the pan is filled. Put in a moderate oven and bake twenty or thirty minutes. Serve very hot in a deep oyster-shell.

Roasted Oysters.—Take ½ dozen oysters in the shell,

scrub thoroughly, put in a roasting-pan (deep side of shell down), run into a hot oven, and let remain until shells begin to open. Remove top shell, season with salt and butter, and serve in the deep shell.

Broiled Oysters.—Strip 8 broiling oysters and dry thoroughly on a towel. Brush a frying-pan or a griddle with butter, and let it become very hot. Put oysters on one at a time; turn once. Serve on buttered toast. Season with salt and pepper and the liquor poured over them.

Creamed Oysters.—Put 1 level teaspoonful of flour and 1 teaspoonful of butter in a saucepan, stir over the fire until thoroughly mixed, add carefully ½ pint of milk. Stir until it boils. Heat 6 oysters in their own liquor. The minute their beards begin to curl, pour off the liquor and add the hot milk. Season and serve.

Fricassee of Cream Oysters.—Add to creamed oysters the yolk of 1 egg and 1 teaspoonful of chopped parsley.

Oyster Stew.—Put 1 cup of milk in a double boiler, add a blade of mace and an allspice. When it reaches boiling point add 1 teaspoonful of butter, 1 teaspoonful of flour (well mixed). Heat 6 oysters in their own liquor, and the moment their beards begin to curl add carefully to the hot milk. Season with salt and pepper and serve.

Chicken Jelly.—Take 1 pound of chicken with bone; 1 pint of cold water; 1 bay-leaf; 1 stalk of celery; 1 sprig of parsley; 1 clove. (Any combination of these flavors can be used.) Crack the bones (for the jelly). Put on the fire with the water and flavorings, and let cook slowly two hours (or until it cooks down one-half). Strain, skim off the fat, clarify (see recipe for bouillon); stand away to become jellied.

Wine Jelly.—Take 1 box of gelatin; ½ cup of cold water; ½ cup of boiling water; ½ cup of wine; ¼ cup of sugar. Soak gelatin in cold water two minutes,

then stand in saucepan of hot water over fire until dissolved; add the boiling water, sugar, and wine; strain. Pour into a mould and stand on ice.

Orange Jelly.—Made like wine jelly, substituting ½ cup of orange juice for wine.

Cream Jelly.—Take 2 level teaspoonfuls of gelatin; ¼ cup of cold water; 1 cup of cream; 2 tablespoonfuls of sugar; 2 tablespoonfuls of wine; ½ teaspoonful of vanilla. Soak the gelatin in cold water for two minutes. Let dissolve in saucepan of boiling water. Add wine, sugar, and vanilla. Stir in the cream carefully, strain, pour into a mould, and stand on ice.

Lemon Jelly.—Use Knox's granulated gelatin, ¼ of a box; 1 level tablespoonful and ½ level teaspoonful of gelatin; ½ cup of cold water; 1 cup of boiling water; ⅜ cup of sugar; juice of 1 lemon. Soak gelatin in the cold water two minutes. Dissolve it by standing it in a saucepan of boiling water. Add sugar, lemon juice, and hot water. Stir and stand on the ice to cool.

Pulled Bread.—Cut the crust from a long loaf. Divide it carefully in two, lengthwise. Divide each half into four, lengthwise. Place these pieces in a pan and dry them thoroughly in a moderate oven; then brown quickly in a hotter oven.

CHAPTER XV

Death in a Private House—Requirements Concerning Contagious Diseases and Vaccination.

WHEN death occurs in a private house, after a suitable time has passed for the family to recover from the shock, the nurse should tactfully request them to withdraw and should then prepare the body for burial. The body should be sponged, pledgets of cotton placed in the rectum and vagina, and the mouth closed by placing a wedge of some soft material between the chin and sternum. The objection to the bandage which is sometimes passed beneath the jaw and over the head for this purpose lies in the fact that often a deep ridge in the course of such bandage results and disfigures the face. The eyelids should be closed and retained by wet compresses until fixed. The body should then be lightly covered, the windows raised, and the shutters bowed. In cases of unexpected death the nurse should always send word to the attending physician. In the majority of cases, where death is foreseen, either the physician remains himself or arranges for an assistant to remain at the house, or gives the nurse some definite directions in regard to the course to pursue.

It is an almost invariable rule that the family of a dying patient wish to be present at the last moment of life, and entrust to the nurse the responsibility of summoning them to the bedside. This responsibility the nurse should accept guardedly, assuring the family—if the question is openly discussed—that death may come suddenly and without previous warning, though in the majority of cases the gradual failure of pulse and respiration foretell the change.

There are certain regulations which are laid down by the State and city authorities governing the actions of those afflicted with contagious diseases, and to some extent those who come in contact with such cases, with a view to limiting the spread of these diseases. The act passed in the State of Pennsylvania and the rules adopted by the Philadelphia Board of Health are very fair examples of the scope and intention of all such laws elsewhere.

The first sections of the Pennsylvania State Act direct that a physician in attendance on a case of cholera, smallpox (variola or varioloid), diphtheria (or diphtheritic croup), scarlet fever, typhoid fever, relapsing fever, yellow fever, epidemic cerebrospinal fever, and leprosy shall make a report of such case to the health authorities on a blank supplied for the purpose. In Philadelphia this list has recently been extended to include nearly every infectious disease.

On receipt of this report from the attending physician the Board of Health shall direct that the house in which the contagious disease is present shall be placarded with a sign stating the nature of the disease existing; and such placard may not be removed until recovery of the case and disinfection of the house according to such methods as the health authorities shall direct.

In regard to the death of persons of any of the contagious diseases the act directs that the undertaker or person having the body in charge shall disinfect the body and place it in a coffin within six hours after being sent for, provided the call has been between five A.M. and eleven P.M.; otherwise the limit is extended to twelve hours. The coffin must then be tightly closed, and not reopened except under special circumstances after the consent of the health board has first been obtained.

The burial must take place within thirty-six hours

after death, and no formal funeral is permitted. Carriages for none but the immediate adult family may be supplied by the undertaker. Services may not be held in any public place, and must therefore be conducted at the house and the grave. The public notice of the death must make mention of the cause of death if contagious.

The removal of a body dead of a contagious disease must always be effected by means of a hearse or wagon used only for corpses. It is also illegal for anyone suffering from a contagious disease to go about in public conveyances or expose themselves and cause danger of contagion to others. Children the subjects of contagious diseases, must not return to school until thirty days have elapsed since their recovery and disinfection of the house. The same rule applies to other children remaining in the infected house, even though they are not the subjects of the disease, and the clause covers not only day-schools, but also Sunday-schools and kindergartens.

The letting of rooms or a house in which a contagious disease has existed, unless such house or rooms have been disinfected, is also punishable.

Finally, the act empowers the municipal authorities to effect isolation of contagious cases in such way as seems fit.

In smallpox cases in our cities this isolation is very strict, and is maintained by stationing policemen at the front and back of the infected house and preventing all exit and entrance. The penalty of infringement of any of these rules consists in a fine of not less than five dollars and not more than one hundred, and in default of payment, imprisonment of not more than sixty days.

Vaccination of school children is almost universally compulsory, and the children are required to show certificates of successful vaccination before being admitted to any school, public or private.

CHAPTER XVI

THE PREPARATION OF SOLUTIONS AND THEIR USES.

THE preparation of solutions of given strength either from a solid or fluid is a matter involving some little knowledge of arithmetic, and often considerably puzzles a nurse. It is customary to speak of some solutions in percentage terms, others in those of the number of grains per ounce, while in some instances, though rarely in this country, the metric system is employed.

In the case of the more commonly used solutions, such for instance as those of bichloride of mercury, tables are published which illustrate the quantities necessary for a number of solutions of various strengths, thus affording a short cut and saving the necessity of making arithmetic calculations. This, however, is scarcely practicable with all drugs used by nurses in disinfection of hands, instruments, fæces, etc., and the object of this chapter is to give a few arithmetic formulæ in as simple a form as possible in order to make the nurse conversant with these very necessary matters.

At the same time certain of the more commonly employed drugs will be mentioned, as well as their application to either medical, surgical, obstetrical or gynæcological practice.

Normal salt solution is a solution which resembles the blood in its alkalinity. It is a 0.58 per cent. solution, or 0.6 per cent., which comes near enough for practical uses. It is prepared by adding a drachm and a half or a heaping teaspoonful, to a quart of water.

In making up percentage solutions it is just as well to regard the ounce (fluid) as consisting of 500 grains instead of 480 which is the more accurate.

For instance, an ounce of a 1 per cent. solution would consist of 5 grains of the required substance dissolved in one fluidounce of water; or expressed in terms which are not uncommonly applied to silver nitrate solutions, it would be 5 grains to the ounce, or 1 to 100.

A 1 to 1000 solution is made by dissolving 15 grains of the desired drug in a quart of water. Carbolic acid solutions are commonly used and spoken of as 1-20, 1 to 40, etc., which means 5 per cent. and 2½ per cent. respectively. It would appear then that if these small formulæ should be memorized that the multiplication or division necessary to make up solutions of various strengths and percentages would depend largely upon a knowledge of Apothecaries' weight which should be familiar to all from childhood up.

60 minims	1 drachm (fluid)
8 drachms	1 ounce (fluid)
16 ounces	1 pint
32 ounces	1 quart

It is important also to remember a few relative values that exist between the metric and English systems:

15 grains	1 gram
1 cubic centimetre	15 minims
30 c.c.	1 ounce (fluid)
1000 c.c.	1 quart

To make a drachm of 4 per cent. solution of cocaine for immediate use from tablets, one must consider that a 4 per cent. solution is 4 to 100 or 1 to 25; a drachm being 60 drops, there must be one grain of cocaine for every 25 drops or fraction thereof contained in a drachm, *i.e.*, 60/25 or 2.4. Unless great accuracy is imperative ten ¼ grain tablets dissolved in the drachm would be sufficiently near the strength desired.

To give a fraction of a dose smaller than a stock solution the strength of which is expressed in a fraction, multiply the denomination of the fraction of the given solution by the minims containing it, and divide this in turn by the amount required.

To give the 1/60 grain of a drug when the solution on hand is so made that:

5 minims = 1/20 $\quad$ 20 × 5 = 100 or
1 minim = gr. 1/100 $\quad$ $\frac{100}{60}$ = 1⅔ minims = 1/60 grain.

A fraction of a minim may best be calculated by diluting one minim in water in such a way that a part of the solution may be made to represent the desired quantity. Thus to give ⅔ of a minim, dilute one minim in 3 minims of water. Two minims of the mixture will then equal ⅔ minim; ¾ of a minim, by adding 3 minims of water to the minim of the drug and then administering 3 minims of the solution.

To prepare a quantity of a solution of given strength from a more or less concentrated solution requires a little more mathematics than any of the preceding examples.

Thus if a 10 per cent. solution of silver nitrate is at hand and some two quarts of a 1 per cent. solution is requested, the proper strength may be arrived at by reducing the terms of percentage to proportion (a 10 per cent. solution = 1 to 10, while a 1 per cent. solution = 1 to 100), and then dividing the weaker by the stronger solution and the total quantity desired by this result:

10/100/10 $\quad$ 2 quarts = 64 ounces divided by
100 $\quad$ 10 = 6.4 oz.
4/10 oz. = $\frac{48}{10}$ = 3 1/5 dr.
1/5 × 60 = 12 grs.
6 oz., 3 drachms, 12 grs.

In two quarts of water will make the 1 per cent. solution desired.

Carbolic acid in strength of 1 to 20 and 1 to 40 is used for disinfecting instruments and hands as well as fæces, though it is by no means as commonly used for the hands as is bichloride of mercury. Sputum should be disinfected with 5 per cent. carbolic solution unless it be possible to receive it in pasteboard cups which may be burnt.

Bichloride of mercury is very widely used as a disinfectant in medical, surgical, obstetric and gynæcologic practice. It is the most common of all antiseptic hand washes.

In solution of 1–1000 and 1–3000, disinfection of the hands may be accomplished.

In strengths of 1–5000 and 1–10,000 it is employed in vaginal and intra-uterine douches.

For washing out of surgical cavities a solution of 1–5000 is commonly used.

Boracic acid may be used in saturated solution for douching of the eyes, vagina, or surgical wounds. It has the virtue of being non-irritating though not strongly antiseptic.

Creolin in ½ to 2 per cent. solution in surgery as vaginal douche in strength of ½ to 1 per cent.

Silver nitrate is used as an eye wash for the newborn, a drop or two of ¼ per cent. solution being dropped in the eye immediately after delivery. In throat practice solutions of 10 gr. to oz. to 40 gr. to oz. are applied.

In bowel irrigation strength of 1–10,000 may be used and in the same proportion as vaginal douches.

Formalin (trade name) is a 40 per cent. solution of formaldehyde gas. It has been extensively used as a preservative of milk and foods of various sorts. The solutions of formaldehyde are not much used in sur-

gery, but largely in the disinfection of furniture, floors, etc. The gas itself is commonly employed for general disinfection of closed chambers after infectious illnesses.

Lead water and laudanum is frequently applied to fresh contusions where the skin is not abrased and to sprains and fractures. It is prepared by adding 256 grains of lead acetate and one ounce of laudanum to one quart of water.

Argyrol is a silver preparation which is used in treatment of inflammation of mucous surfaces, eye, nose and throat, and as a vaginal douche or irrigation in strengths of 1–4 to 1000. In the eye from 5 per cent. to 25 per cent.

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NAME	DATE DUE